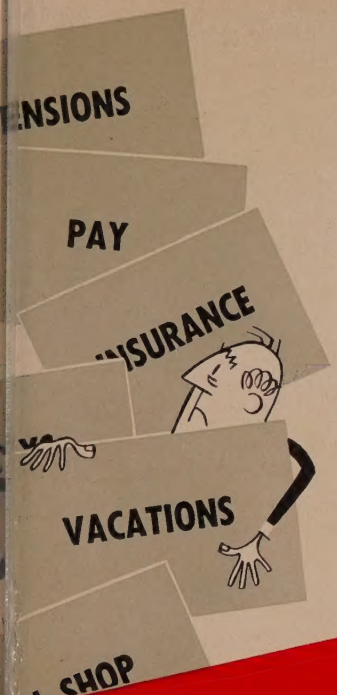
MARCH 5, 1956

STEEL
The Metalworking Weekly
A PENTON PUBLICATION



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Get set now for a Supplemental Unemployment Benefit demand. Your union may not ask for SUB this year, but chances are it will eventually . . . page 51

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Choosing a stainless steel supplier is like choosing a friend; all else appearing equal, the intangibles of service and reputation stand out. Many users of stainless steel turn to B&W because they know B&W's reputation for quality and service, and because they know that B&W controls every step in the tube-making operation from pouring the stainless ingot to carefully inspecting the finished stainless tube. Because B&W quality control more than satisfies all customer and code requirements, every buyer of B&W stainless steel tubes is assured of manufacturing skill, uniformity and close tolerances in every foot of stainless tubing he acquires, and quick service via a nationwide network of B&W stainless tubing distributors.

Take a tip from the experience of thousands in the process industries, as well as architects, designers, fabricators and finishers, and get in touch with Mr. Tubes, your link to B&W, for a detailed story of the advantages of B&W stainless tubing and how you can get more for your money with stainless. *Or write for Bulletin TB 355.*

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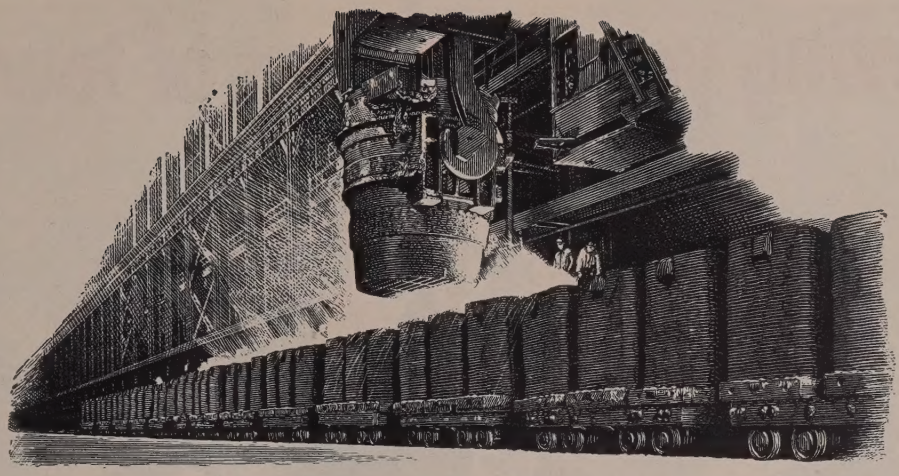

Meeting the Demand

The following message from E. G. Grace, Chairman of Bethlehem Steel, appears in the company's Annual Report to Employees for 1955. If you would like to see the report, your request to us at Bethlehem, Pa., or the nearest Bethlehem office, will bring a copy to you promptly.

To the Employees:

It is very gratifying to report that our mutual efforts last year resulted in the production and shipment of more steel than ever before in Bethlehem's history.

The expansion and improvement of our facilities to meet a growing demand for steel products have brought benefits to our company and employees through increased production and earnings.

It was a notable year, one which showed that our large investments for growth have been bearing fruit. We cannot stop here.

The United States is growing and the steel industry must keep pace with that growth. Our rising population with its steadily increasing per capita consumption of steel creates a demand for goods using steel which must be supplied by private enterprise.

Bethlehem's response has been to launch the greatest expansion program in the company's history. Within the next two years we shall spend some $300,000,000 in adding more than 3,000,000 tons of annual ingot capacity.

In recognition of the needs of the country, the steel industry as a whole is planning the addition of 15,000,000 tons of annual ingot capacity in the next three years.

The financing of such a program is not an easy task. In the past, much of the expansion was brought about by improving or adding to existing installations. However, additions to capacity in this manner cannot continue indefinitely. In the future, the industry, and Bethlehem, must create entirely new capacity—integrated from raw materials to the finished product—to serve properly the demand of the public. This is much more costly.

For this reason we must maintain adequate earnings to attract investors and to have funds to put back into the business. This requires the maintenance of sound financial practices, realistic price and wage policies and continuing progress on the technological front. But, we must have also an enlightened public policy to assist us by means of sound government tax policies which will encourage expansion and development.

We have been presented with many problems in our endeavor to meet the great demand for steel that occurred during the last half of 1955. New problems will arise. But the response of our employees through record production last year shows what can be done.

I am confident that the demand for steel will remain strong throughout the year. Our shipbuilding prospects are improving significantly. In short, the immediate future is clear and promising. But the long range job, with all it implies, lies ahead. Production performance such as we had in 1955 will immeasurably ease our task.

The maintenance of steel as a free industry in a free economy is vital to our personal liberties. The growth of the industry is essential to our economy because steel is a basic ingredient. I am sure Bethlehem will do its part.

E. G. Grace

CHAIRMAN

BETHLEHEM STEEL

BETHLEHEM STEEL

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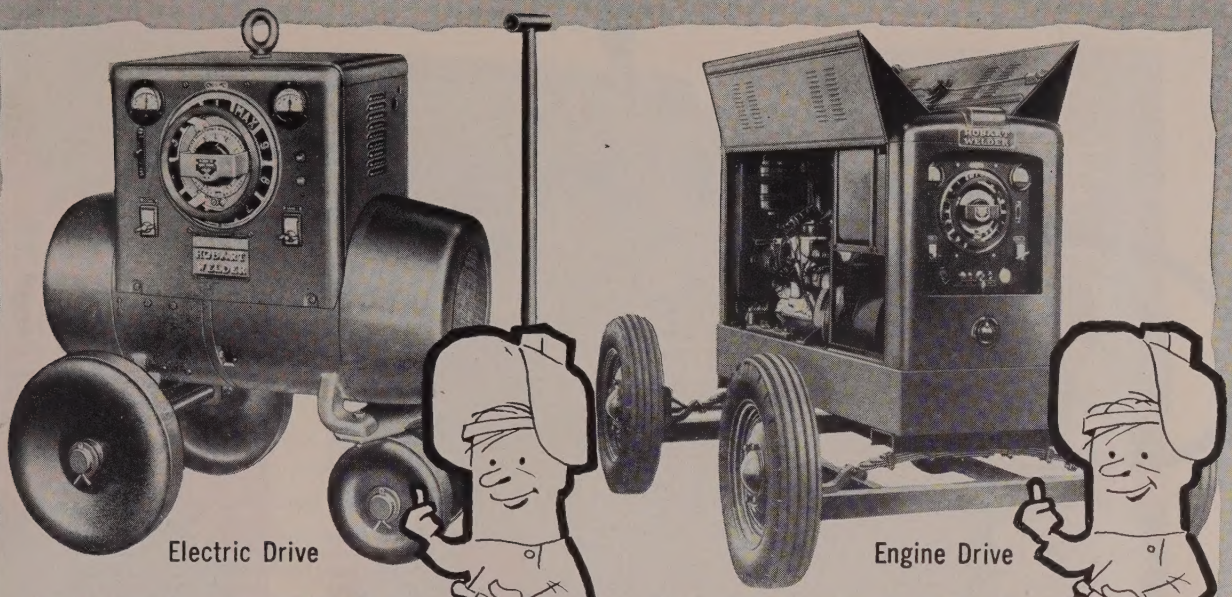

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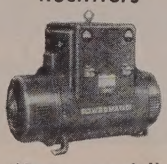

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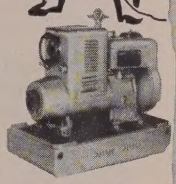
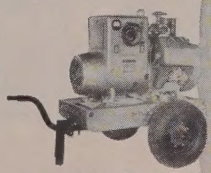


"Husky Boy"

Water Cooled AC-AC



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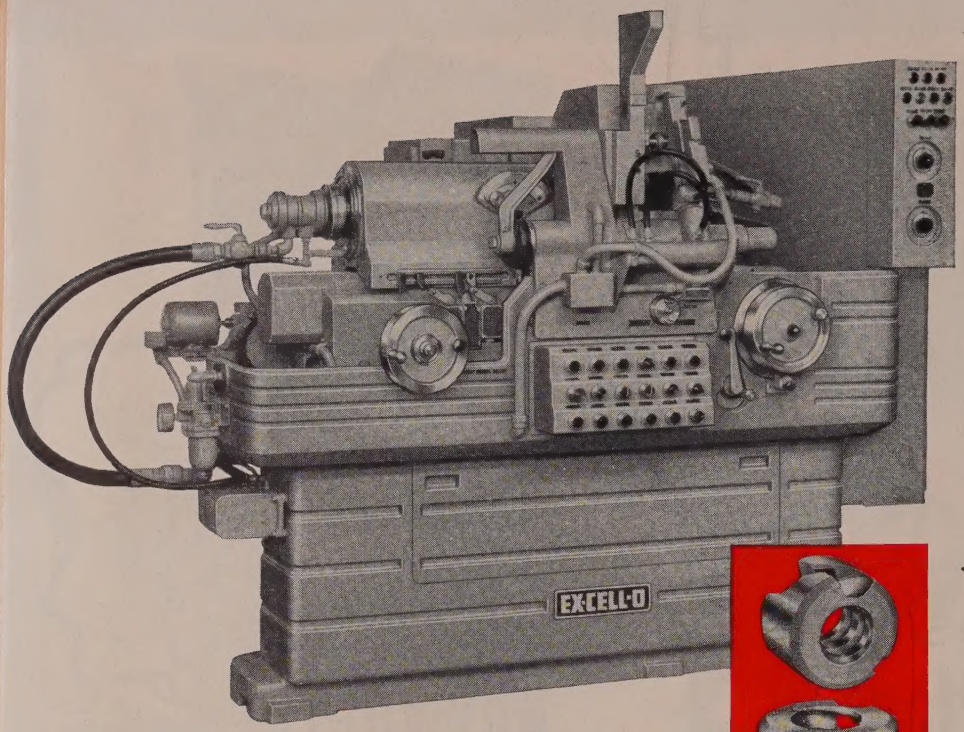


Ex-Cell-O Style 39-A Precision Internal Thread Grinder equipped with automatic work handling equipment. This machine loads, locates, grinds threads and ejects steering gear ball nuts in a completely automatic cycle.

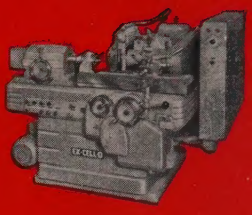
EX-CELL-O Thread Grinders

Manual – Automatic – Automated

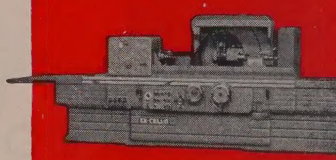
These standard machines are grinding thread gages, machine tool lead screws, innumerable aircraft parts, automotive steering mechanisms and pinions, worms, taps, and many similar workpieces.

Precision thread grinders in this Ex-Cell-O line range from manually-operated models, for toolroom and for short runs, to high production automatics, to styles equipped with automatic work handling equipment. There are five models designed to meet your every requirement.

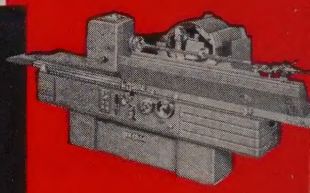
For specific information on thread grinder operations or a quotation on a machine for your requirements, call your local Ex-Cell-O representative or write Ex-Cell-O in Detroit.



EX-CELL-O STYLE 33 FOR EXTERNAL THREADS: An accurate production machine, automatic except for loading, unloading, and moving the cycle lever. Can be arranged for tapered grinding and for eccentric relief grinding.



EX-CELL-O STYLE 36 FOR LONG EXTERNAL THREADS, also available with internal attachment. A high production machine with easily adjusted work cycles.



EX-CELL-O STYLE 50: A versatile machine for external work . . . also available with internal attachment.

EX-CELL-O STYLE 120 Our largest Thread Grinder. Grinds 10 feet thread in one setting. Accommodates 12 feet stock between centers.

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EX-CELL-O for PRECISION

STEEL
The Metalworking Weekly

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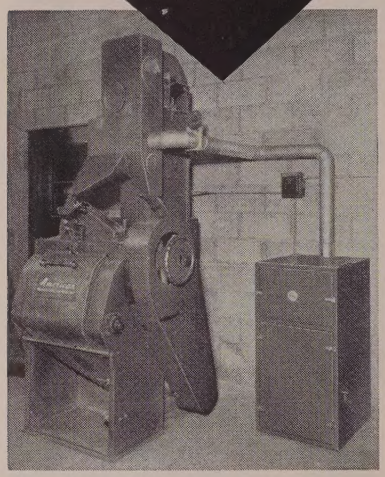
how to trap dust

that damages your machines and hurts company morale



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behind the scenes

Play goes from Colbert to Kettering, with assist from Harper and Choate, as:

NBP Awards Quill to Kettering

NBP is an association of publishers of technical, professional, industrial, scientific, merchandising and marketing magazines. Once a year it meets in Washington and awards a Silver Quill to someone who has made outstanding contributions to business, industry and government. This year it selected Charles F. Kettering of General Motors as the recipient.

The award was made Feb. 10, at the Statler hotel. Reading from left to right in the photograph above, we see L. L. (Tex) Colbert, president of Chrysler Corp., handing over the quill (say, that's a mighty impressive penholder assembly, isn't it?); Robert E. Harper, president and secretary of NBP, supervising the operation; Rufus Choate, chairman of the NBP board and president of the Scott-Choate Publications (recovering his breath after delivering some laudatory opening remarks); and Charles F. Kettering, one of the most highly honored Americans, reaching out with both hands to accept the award.

"He has never settled back," said Mr. Colbert, "and looked upon past accomplishments with complacency. He gets his fun and satisfaction out of new problems. As he once said: 'The minute you get satisfied with what you've got, the concrete has begun to set in your head!' "

Defense Orders, 5000 B.C.

Over in England, land of jugged hare, chutney, scepters and kings, the Iron & Steel Institute publishes a highly learned and erudite monthly called *Journal of the Iron & Steel Institute*. On page 49 of the January issue appears an article, "The Structural Iron of the Parthenon," prepared by C. J. Livadefs, D. Sc.

C. J. was formerly assistant professor at the Athens Technical University, and is now with the Athens Piraeus Electricity Co.

Well, in developing his theme, Dr. Livadefs mentioned in passing that the father of Lysias opened a workshop in Piraeus sometime in 5000 B.C., and employed 120 slaves, most of whom were displaced persons. This was an outstanding industrial undertaking in Attica at the time: Blacksmiths worked at their forges from dawn til dark, and the smoke of their fires could be seen from the peaks of distant mountains by watching enemies.

But the Lysias plants worked strictly on defense orders. Their entire output consisted of iron shields.

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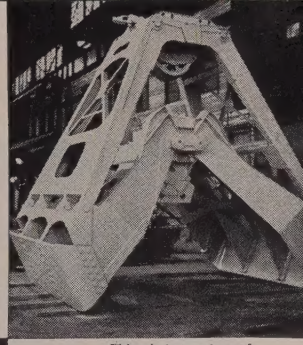
(Metalworking Outlook—Page 45)

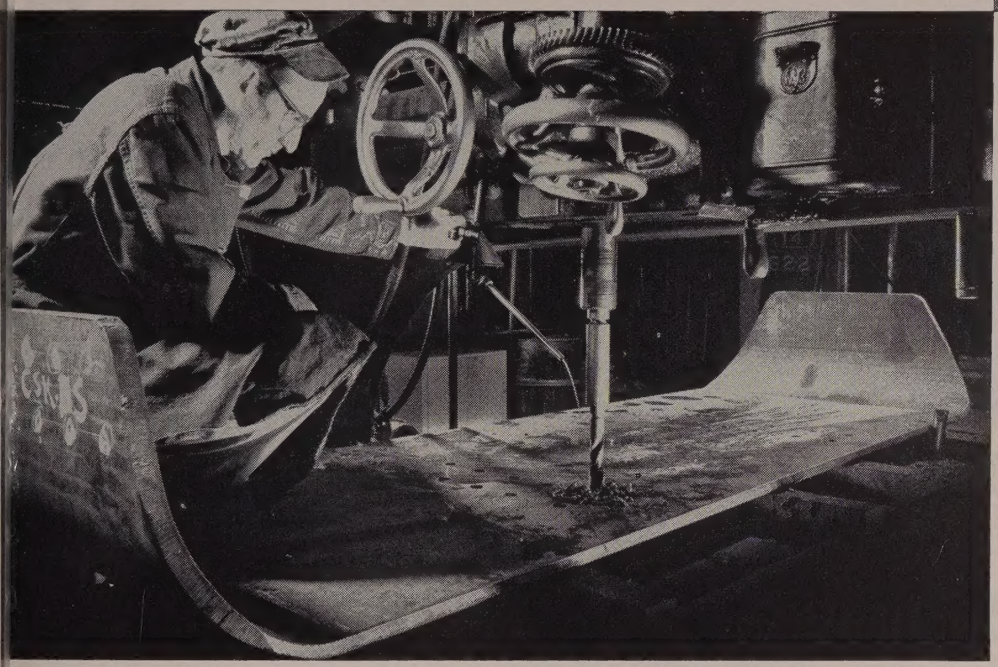
In ore clean-up buckets

FABRICATION SIMPLIFIED WITH USS "T-1" STEEL

(and weight reduced more than ½ ton)



This photo courtesy of Blaw-Knox Company.



HALF AS THICK! In the trays for giant ore clean-up buckets, 1¼" USS "T-1" Steel Plate, with a yield strength of 90,000 psi., replaces cast trays which were as much as 2½" thick. The new buckets —lighter in weight by more than half a ton — and expected to outperform the heavy cast trays, will be used at United States Steel's South Works.

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION,
WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

• The trays of ore clean-up buckets must have phenomenal shock and abrasion resistance to hold up under constant scraping and scouring along the steel bottoms of ore boats. They are commonly made of heavy steel castings. But recently, Blaw-Knox Company, Pittsburgh, Pa., *fabricated* trays for several new buckets from USS "T-1" Steel Plate. This amazing new alloy steel assures the needed strength and durability, plus important fabricating advantages.

LESS WEIGHT — LESS EXPENSE

Biggest single advantage of fabricating from "T-1" Steel Plate is less weight. New trays weigh only 4,021 pounds each, compared to 5,068 pounds for comparable cast manganese steel trays. Thus, "T-1" decreases the weight of the bucket and reduces shipping and handling costs.

What's more, fabrication from "T-1" simplified the building of these huge buckets. It eliminated the expensive patterns needed for cast trays. Because "T-1" has tremendous resistance to impact abuse and abrasion, it is expected that it will outperform previously used materials.

For these ore buckets, "T-1" Steel is flame-cut to size, *cold formed* in a 1,250-ton press, drilled and then riveted to the bucket shell. "T-1" also can be welded—without pre- or post-heating. Because of its unusual combination of properties, it is cutting costs in many rugged applications.

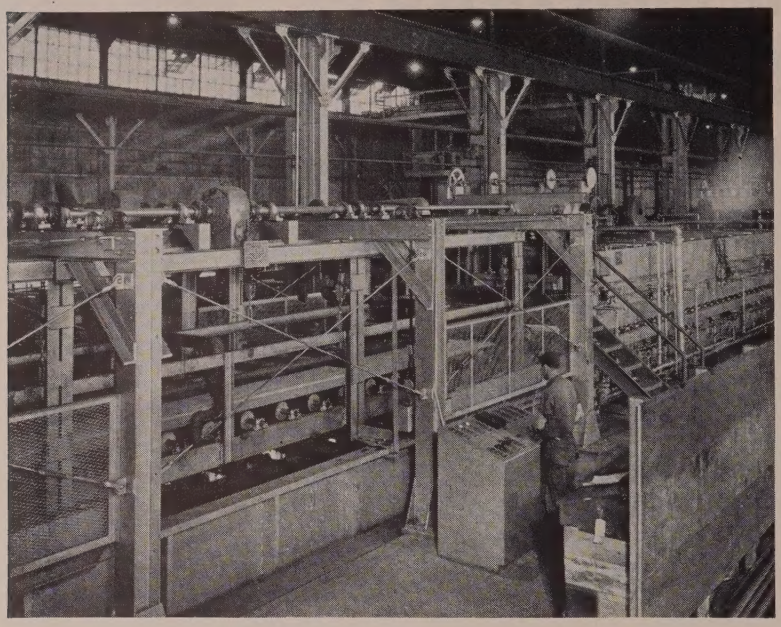
LOOK AROUND YOUR SHOP

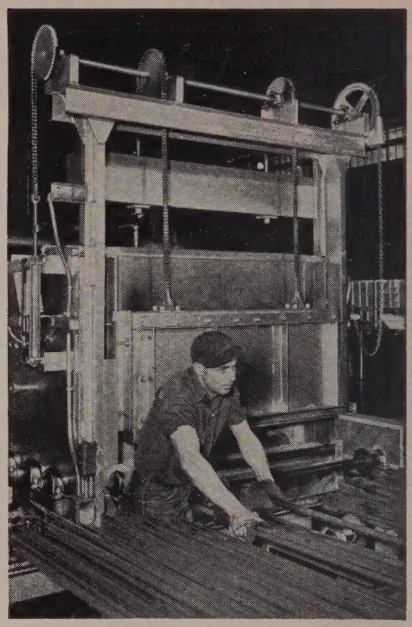
In your own equipment, or in the products you make for others—wherever you would like to increase service life . . . wherever you would like to reduce fabricating costs of heavy-duty parts—look into the possibility of using "T-1" Steel. Competent technical advice is always available, of course — free of charge — from United States Steel. Write, wire, or phone for complete information. United States Steel, Room 5217, Pittsburgh 30, Pa.

USS "T1" CONSTRUCTIONAL ALLOY STEEL

USS TRADE MARK

UNITED STATES STEEL

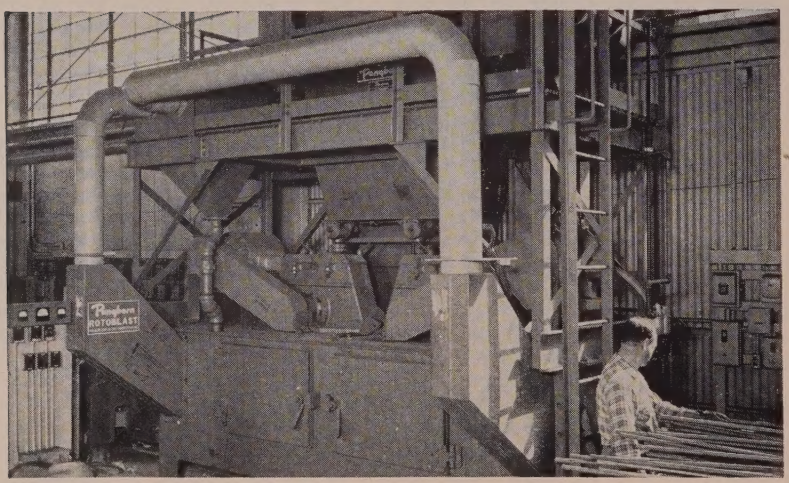




This batch-type, roller-hearth annealing furnace lends itself to the kind of flexibility Rotary needed. Photo at right shows operator preparing a charge at entry end.

Stainless Specialty Mill Highlights Trend at Rotary Electric Steel

Selling more finished bar product is Rotary's aim in this latest growth move. New annealing furnace handles wide range of bars from ½" to 4⅜" and coils of wire.

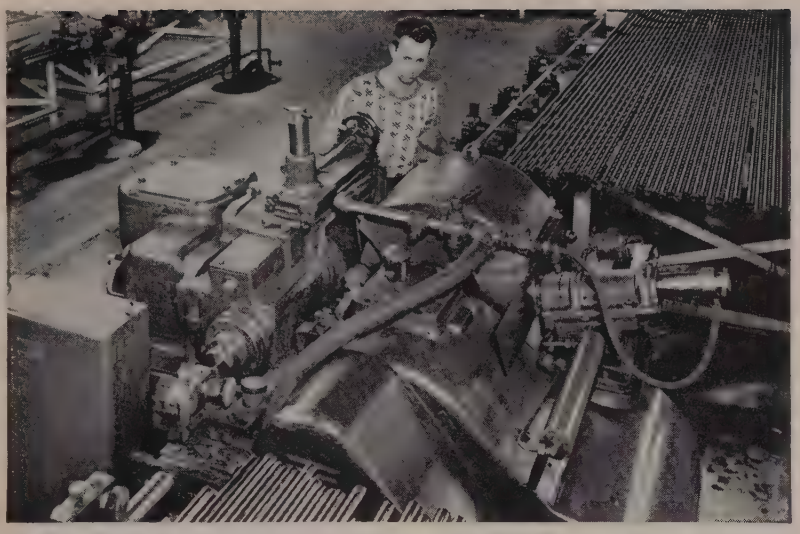


First step in the new finishing department is descaling in this Pangborn machine. Scale is shot blasted from stock which is rotated as it moves through machine.

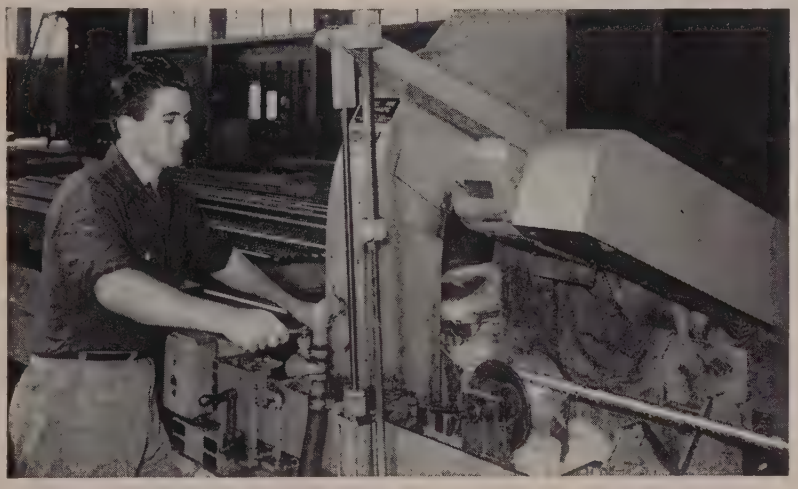
When you walk into the new mill building at Rotary Electric Steel's 47-acre Detroit plant, you find yourself in one of the most modern stainless processing mills in the industry.

This new facility is the result of a decision made two years ago to market more of the company's stainless output in finished items. The stainless specialty bar business was chosen, as Rotary has one of the most flexible bar mills in the industry, but no finishing equipment for flat rolled products.

New Facilities—Production-wise, the decision posed no problems. Rotary's six electric furnaces with rated capacities up to 60 tons were already turning out stainless, car-



After straightening on one of several machines, bars go either to high-speed turning machine or to one of sixteen centerless grinders for surface finish or sizing.



Operator of this Campbell wet-abrasive cutoff machine cuts finished bars into warehouse lengths. Several such machines are employed.

New storage facilities insure the prompt servicing of inquiries and orders for quality stainless bars. Note the extreme size variation.

bon, and alloy steels. The versatile blooming mill rolls sections from 6″ square to 19″ square, and slabs from 44″ wide down to a thickness of 2⅛″. This mill is equipped for fast roll changes, as are the five-stand billet mill and the semi-continuous bar mill.

While the bar mill at Rotary is flexible, and rolls rounds from ½″ to 4⅜″ and hexes from ½″ to 2″ in diameter, a new combination hand and mechanical mill is now being installed that will cover a wider product range and have considerably greater flexibility. For the new program, completely new stainless annealing facilities were needed. The Drever roller-hearth furnace was chosen for its ability to handle a wide range of bars from ½″ to 4⅜″, and coils of wire.

A new batch-type roller hearth annealing furnace, which is 153 feet long, accommodates bars up to 36 feet long or several skids of coiled wire. Cold bars are arranged on the 40-inch wide entry table while the preceding batch is in the furnace. When heating is complete, operator moves the hot batch out and cold batch in at 105 fpm. Output is about 3 tons per hour of 300-series alloys.

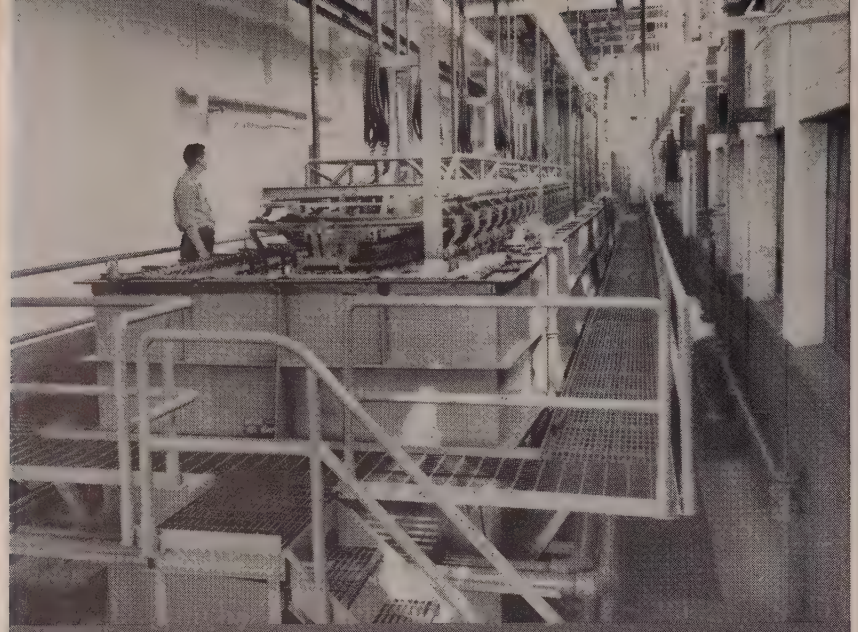
Finishing Department — After annealing and quenching, stainless bars move into the new finishing department where bars, shapes, and wire are converted into warehouse items.

Bars may first get a shot blasting in the new Pangborn 2-wheel machine, following which they are pickled, cold-drawn, centerless ground on one of sixteen Cincinnati machines, and cut to length on a Campbell wet-abrasive cutoff machine. Or, they may be straightened, turned on a high speed Medart machine, and then centerless ground.

Finished bars are approved to meet definite specifications before shipping to either customers or to warehouse racks.

A stock of hundreds of tons of finished stainless steel bars is available for immediate shipment. New storage facilities insure the prompt servicing of inquiries and orders.

New Color Brochure — "How Steel Is Made at Rotary" is a 4-color booklet that shows the plant and facilities of the company. Copies can be obtained by writing Rotary Electric Steel Co., Box 4606, Detroit 34, Michigan. Rotary has sales offices and agents in Detroit, Indianapolis, Newark, N. J., Cleveland, and Chicago.



This Udylite Machine Cleans, Plates and Processes 480 Auto Grilles per hour AUTOMATICALLY

A complete production operation—applying nickel-chrome plate to steel radiator grilles—is handled by three men and this Udylite machine. The entire operation of cleaning, plating and rack strip are handled by the machine—the loading and unloading of parts are the only manual operations. The stampings are approximately 8″ x 36″ in size and to assure them of a flawless finish Udylite installed a Horizontal Cathode Agitator. In addition, a high current density chrome strike is applied before the chrome plate.

This is just one more example of how Udylite machines are meeting the pace of mass production. And Udylite machines are adaptable to practically any metal finishing operation you can name. Why don't you find out more about how Udylite can fit into your operations? Just call your nearby Udylite representative or write direct for the full details. There's no obligation.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

LETTERS TO THE EDITORS

Lauds Series of Articles

I would appreciate a reprint of the story, "Steel Braces for Labor Talks" (Feb. 20, page 65) . . . also two sets of the six articles in your series on temperature control of heat treating furnaces. These are excellent and are deserving of praise.

Anton Brasunas
Director
Metals Engineering Institute
Cleveland

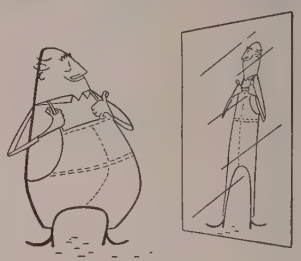
Metal in Plastic Overcoats

We read with interest your article, "Plastic Overcoats for Metal" (Feb. 20, page 114). We feel we have an application for this nylon coating process. Could you supply us with the address of the company which is processing parts?

J. G. Newman
Chief Chemist
Hobart Mfg. Co.
Troy, O.

• *Write Polymer Processes Inc., 125 N. Fourth St., Reading, Pa.*

Stainless Steel Mirror Finish



Please send three copies of your article, "The Finish That Fits" (Feb. 13, page 92). This is the finest article on stainless steel finishes which I have seen.

Richard Westphal
Work Order Department
Joseph T. Ryerson & Son Inc.
Milwaukee

I have read this article with interest and would appreciate three copies. I should like to take this brief opportunity to express praise for your publication. I enjoy reading it.

R. C. Crossman
Purchasing Agent
Benrus Watch Co. Inc.
Waterbury, Conn.

Sums Up Data Well

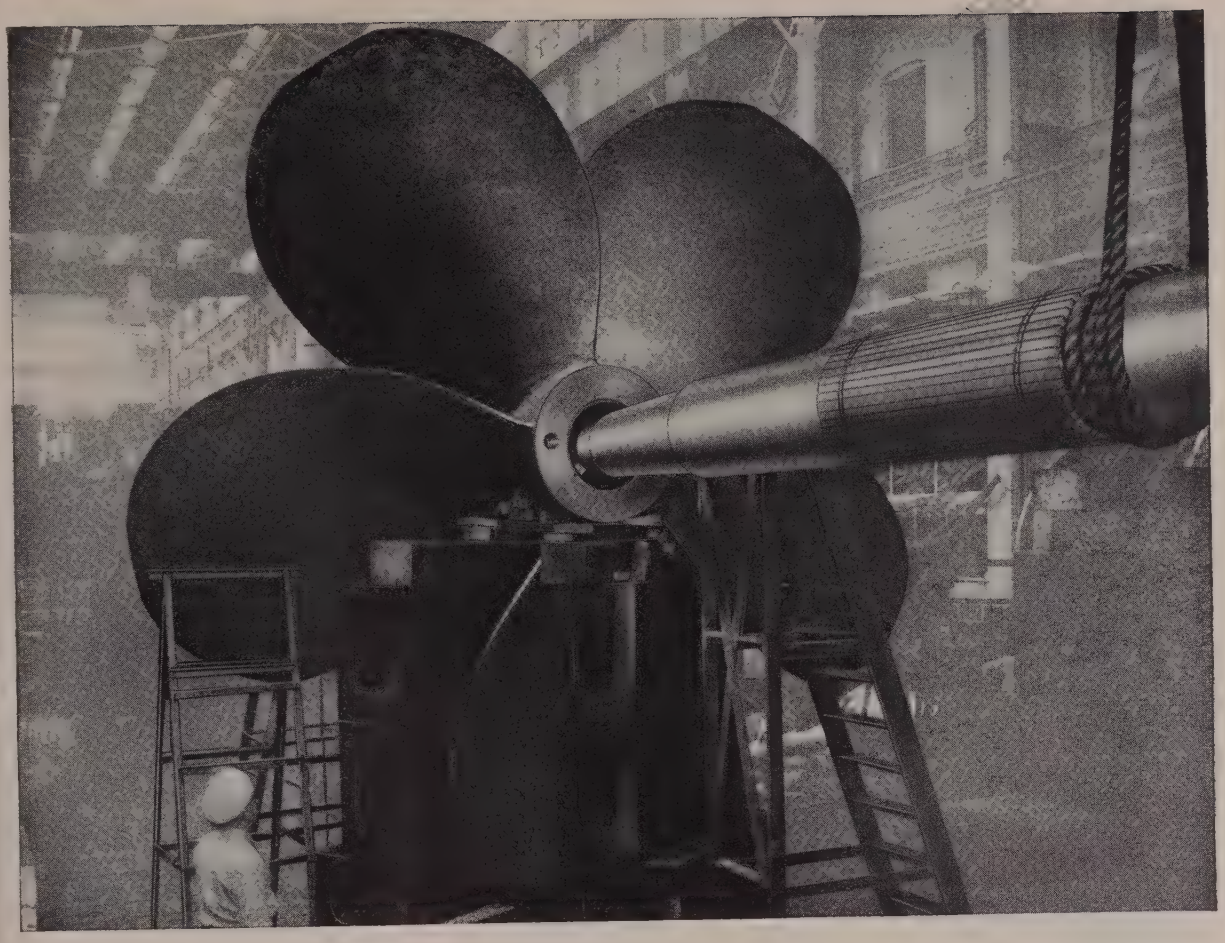
Your article, "What You Can Do About Metal Fatigue" (Jan. 16, page 68), was an excellent condensation of the subject matter. Would you forward 20 additional copies?

T. P. Powers
Office & Steel Service Plant
Joseph T. Ryerson & Son Inc.
Chicago

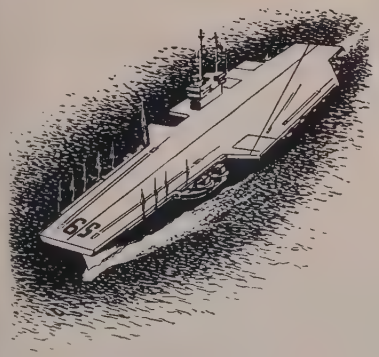
Articles Saved for Reference

As a student of metallurgical engineering, I found your article, "Heat Treating To Produce Pearlitic Malleable" (Dec. 26, page 60), interesting and informative. I would like a copy

(Please turn to page 12)



Aboard the U. S. S. FORRESTAL . . . Erie Forge Propeller Shafts



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Logan Conveyors

LETTERS

(Concluded from page 10)

of this article as well as the preceding one, "Heat Treating To Produce Malleable Iron" (Dec. 19, page 106). These articles will be a welcome addition to my reference material.

John B. Nail Jr.
70 15th St.
Wheeling, W. Va.

Chart Has Twofold Use

Please send two copies of the article, "Automation: How To Plan It" (Jan. 30, page 42).

Our interest is because we have an IBM 702 electronic data processing machine and are considering the installation of 705s. It seems to us that the table, "Ten Musts for Automation," applies almost as well to the processing of data as to the manufacture of goods.

L. D. Whitcher
Commander, SC
U. S. Navy Aviation Supply Office
Philadelphia

Mail to Japan

On the page following your Market Outlook column, you publish the average prices of steel as given by the U. S. Bureau of Labor Statistics. We would like to know the specifications, mill base prices, typical extras and deductions from which these average prices are computed.

K. Kanno
Chief-Marketing Research Section
Nippon Steel Tube Co. Ltd.
Tokyo, Japan

• *We are forwarding a description of the products and the price extras used by the U. S. Bureau of Labor Statistics.*

The Bureau uses base prices and extras from a large group of steel producers who keep it constantly informed as to price changes. The Bureau uses these prices in accordance with the descriptions to arrive at average prices and a price index.

Lauds Story on Water

I am impressed by the article, "More Work for Water" (Jan. 30, page 84). Please send three copies of it and the accompanying article, "Dollars Down the Drain" (Feb. 6, page 136).

William K. McKie
Director of Engineering
Bataille, Kane & McKie Inc.
Chicago

Useful for Courses

I should like to receive a copy of the insert, *1956 Metalworking Facts and Figures* (Jan. 2, page 145). I believe this will be useful for courses I teach in marketing and advertising.

Phillip McVey
Associate Professor
College of Business Administration
University of Nebraska
Lincoln, Nebr.

The BUY word for Socket Cap Screws is ALLEN

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BUTTON HEAD CAP SCREWS
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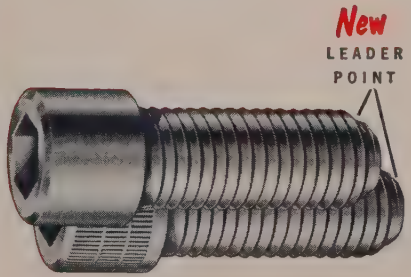

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Next time you're in the market for steel or steel products, it'll pay you to contact CF&I.

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CF&I Claymont, Delaware
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CF&I Clinton, Mass.
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CF&I So. San Francisco, Calif.
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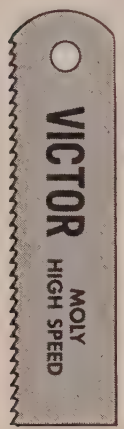

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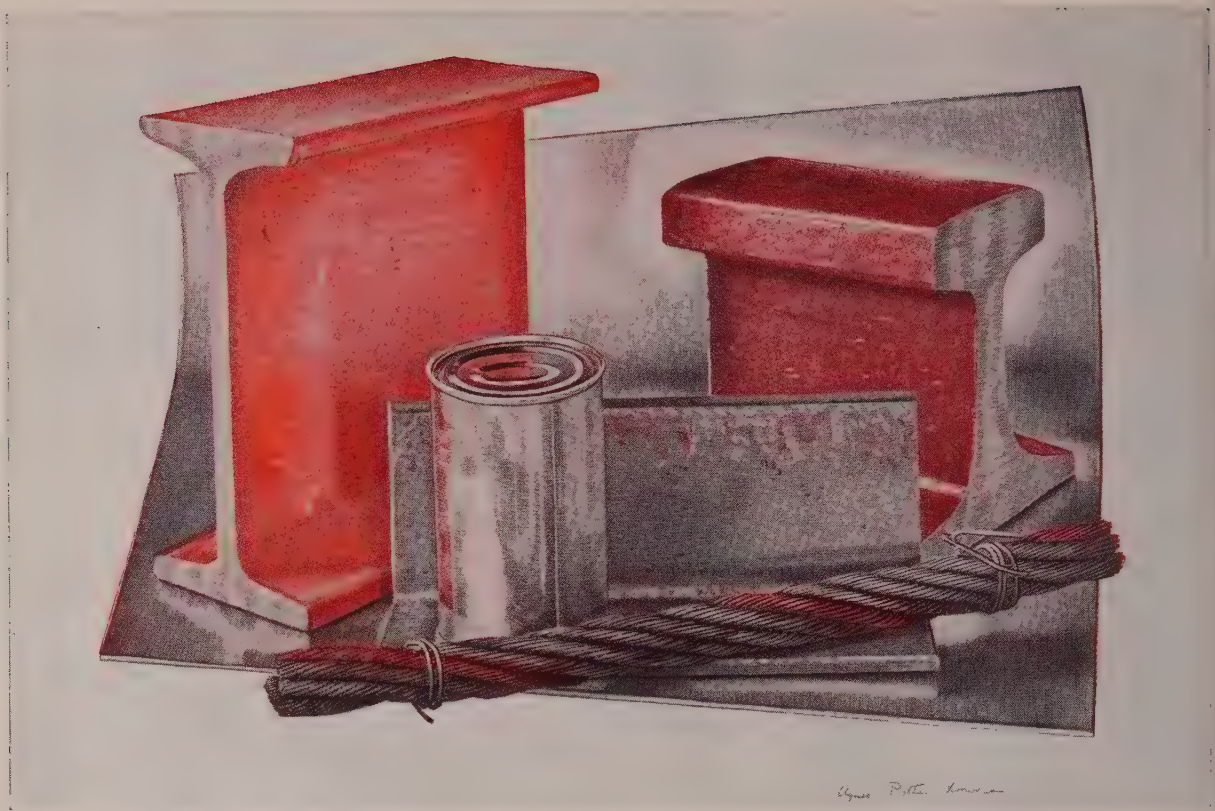

"Steel from the Furnaces." Agnes Potter Lowrie depicts some of the basic steel products which provide the sinews of American industry. The I-beam, key piece in building construction. The angle iron. Wire rope. Railway track to carry the carriers of industry. The can, universal container for foods and liquids. And in the background, sheet steel, gleaming symbol of strength and durability.

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2. Made from freely available domestic materials.

3. Subject to exact chemical control — free fatty acid content to within ½%.

4. Price is not artificial, but fluctuates freely with the domestic fat market.

5. Proved in production to deliver increased tonnage at less cost.

Ironsides research, which developed Palmoshield, is geared to the future. A flexible team — the "custom tailors" of lubrication — Ironsides engineers are available for technical assistance on special problems of any nature or size.

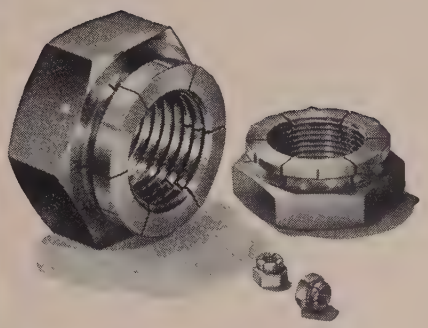
A letter will summon them without obligation. Address The Ironsides Company, Columbus 16, Ohio.

SHIELD PRODUCTS

Ironsides

By the makers of Palmoshield • "the palm tree that grows in Ohio"

PHILADELPHIA TRANSPORTATION COMPANY, Philadelphia, Pa., uses FLEXLOC Self-Locking Nuts on the rear axle flanges of its buses. This carrier has found that FLEXLOCs eliminate sheared studs, reduce maintenance, save time and money.



How FLEXLOC locknuts work

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FLEXLOCs are one piece, all metal—nothing to assemble, come apart, lose or forget. They can be delivered in any quantity in a wide range of sizes. Stocks are carried by industrial distributors everywhere. Write for literature and samples. SPS, Jenkintown 33, Pa.

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FLEXLOC

LOCKNUT DIVISION

STANDARD PRESSED STEEL CO.

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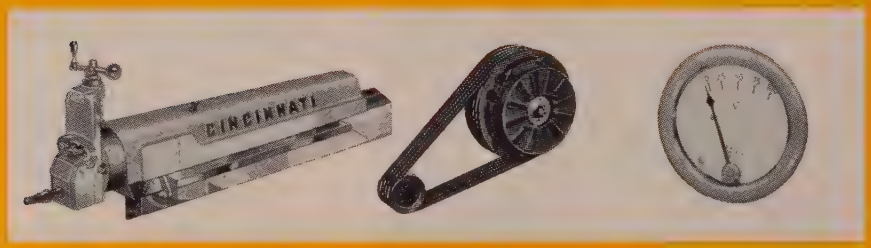
The New slot-free ram also eliminates the manual clamping of ram adjustment—a time saving feature.

A speedy, dependable electro-magnetic brake and clutch insure a faster performance.

50 P.S.I. pressure lubrication, exclusive on Cincinnati Shapers, is a real insurance against wear and a guarantee of long trouble-free performance.

Write for the circular on the New Rigid Shapers.



Nodular iron, slot-free ram

Electro-magnetic Clutch and Brake

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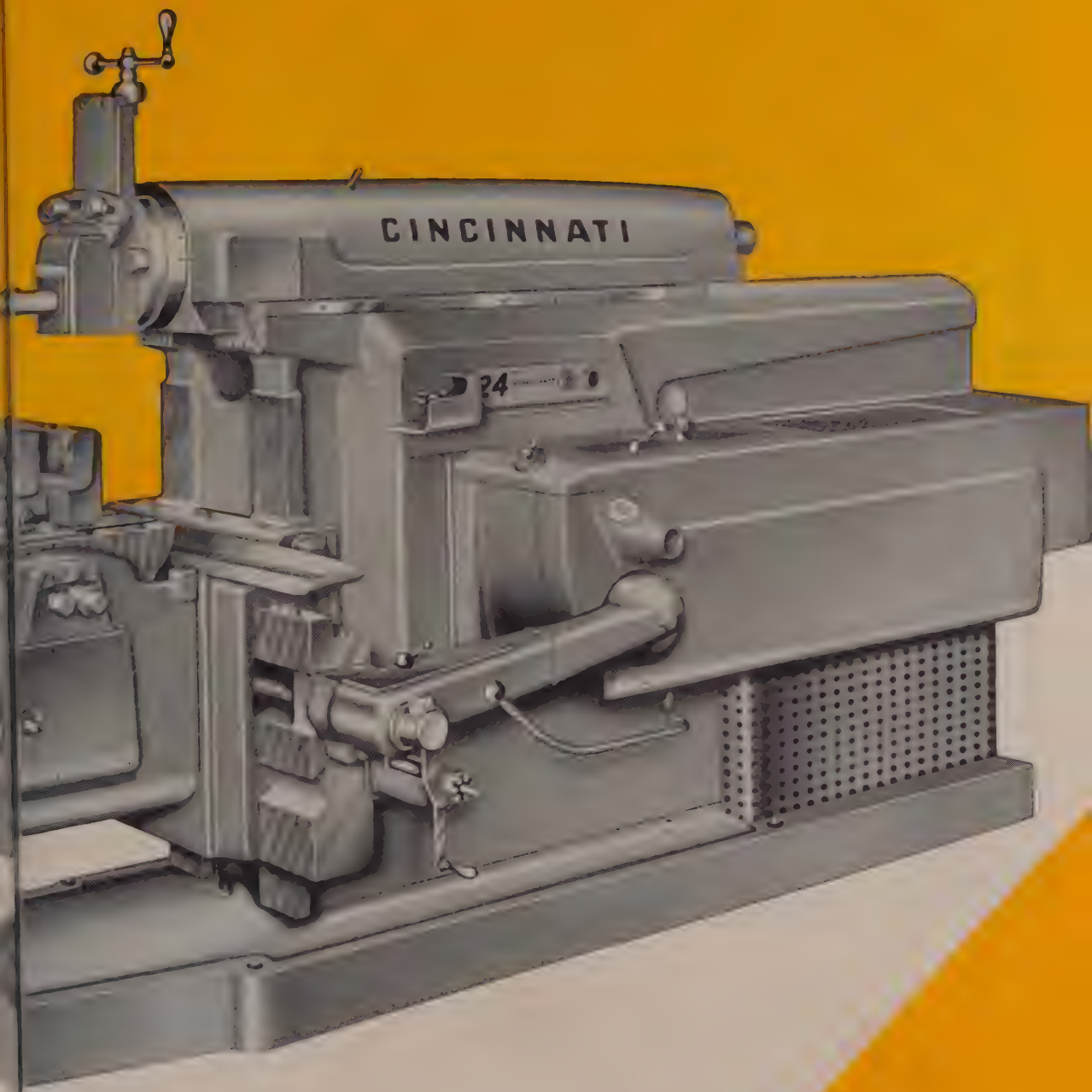

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Coordinated production assures quality in every fastener

How do *you* select fasteners?

They look alike. They're made to standards. You can't inspect each one before you buy. Yet you have to choose wisely, because your sub-assemblies and assembled products, and, in fact your reputation depend on the reliability of the fasteners you use.

There's a way to be sure of the best. Know your manufacturer.

Mine-to-market coordinated production is your key to quality when you specify Republic Bolts and Nuts. Most fastener makers start their processing with steel in the form of coiled rod. But at Republic, this represents a step midway in the process. Our own teams of metallurgists and inspectors are in complete control of all raw materials from ore mine through blast furnace to the steel billets delivered to our Bolt and Chain Division. In fact, we make over 50 different analyses of alloy and carbon steels, each one the finest available for the ultimate use of fasteners it will form.

This painstaking protection of raw material quality is matched by rigid quality control throughout our fastener manufacturing processes. As a result, you receive the very finest headed and threaded products modern materials, methods and technology can produce.

So don't just order fasteners, *select* Republic and be sure of the best. Contact your local Republic representative or distributor today. He can draw on a complete range of 20,000 standard, plus 8,000 special types and sizes to fill your needs. Or mail the coupon for further information.

YOUR PRODUCT QUALITY is protected when you use Republic's Berger Division contract manufacturing facilities. Here you can have sheet metal components or products fabricated to your own standards, by experts using modern methods—and Republic quality sheet steel. Check this means of reducing plant and equipment investment. Mail coupon today.

A TOP-QUALITY CHAIN LINE for production use or product application is available through your Republic Chain Distributor. He carries every type and size of welded and weldless chain, chain slings, attachments and accessories. Each is subject to quality control from raw ore to finished product to provide maximum reliability. Coupon will bring full information.

MATERIALS HANDLING EQUIPMENT QUALITY is also backed by Republic's mine-to-market manufacturing control. As a result, the installation shown not only cut handling costs 25%, but will provide long-term, trouble-free service as well. Republic offers a broad line of materials handling equipment to suit your requirements. For illustrated literature, send coupon.

STEEL

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REPUBLIC STEEL CORPORATION
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Please send complete information on:

☐ Bolts and Nuts
☐ Chain Products
☐ Berger Fabricating Facilities
☐ Materials Handling Equipment

Name_____

Company_____

Address_____

City_____ Zone____ State_____

Case No. 107

Harris Steel Co. Reports:

- 4 Years' Trouble-Free Service
- Constant 24-Hour Operation
- Careful Control of Quality

Michael J. Giordano inspects test burner on one of twin Kemp Atmos Gas Producers.

Bright Annealing Furnaces Use Kemp Atmos Gas Generators to Supply Controlled Atmosphere of Uniform High Quality

Bright annealed steel is produced by Harris Steel Company, Kearny, New Jersey, with the help of two Kemp Model 6-MR Atmos Gas Producers. These two Kemp Generators burn city gas, to supply twelve furnace bases with purified controlled atmosphere.

Treating gas 24 hours a day, seven days a week, each Kemp unit produces 6,000 cfh of gas . . . enough to meet the needs of annealing 4,000 to 5,000 tons of steel per month.

User Reports Complete Satisfaction

Mr. Harry Vane, Plant Superintendent, reports "These Kemp units have been in constant service for 4 years without a bit of trouble. The only maintenance needed has been ordinary routine. Because of the constant purity and qualitative analysis of the gas the Kemp Generators produce, we have been able to secure constant control of color, temper and quality of our output."

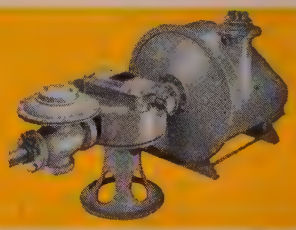
Kemp Can Help You, Too

If efficient, carefully-controlled supply of protective atmosphere gas can help you solve production problems, it will pay you to call in a Kemp Engineer for a detailed discussion of your needs. No obligation, of course.

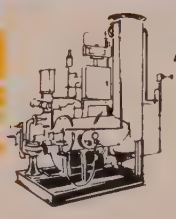
Write to: **C. M. KEMP MFG. CO.,**
405 E. Oliver Street, Baltimore 2, Maryland.

General view of Harris Steel Co. Bright Annealing Department, showing several of the 12 annealing furnaces supplied with Atmos Gas by Kemp Model 6-MR Generators.

This Kemp industrial carburetor—the heart of every Kemp installation—assures the desired analysis of protective atmosphere gas under any demand without waste . . . without frequent adjustments.



KEMP OF BALTIMORE



ATMOS GAS GENERATORS

ADSORPTIVE DRYERS • SINGEING EQUIPMENT
IMMERSION MELTING POTS
CARBURETORS • BURNERS • FIRE CHECKS

CALENDAR
OF MEETINGS

Mar. 5-6, Instrument Society of America, Pittsburgh section: Conference on instrumentation for the iron and steel industry, Hotel Webster Hall and Mellon Institute of Industrial Research. Society's address: 845 Ridge Ave., Pittsburgh 12, Pa. Secretary: Fred Marton.

Mar. 6-8, Society of Automotive Engineers Inc.: National passenger car, body and materials meeting, Hotel Statler, Detroit. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Mar. 11-14, National Association of Waste Material Dealers Inc.: Annual meeting, Waldorf-Astoria, New York. Association's address: 271 Madison Ave., New York 16, N. Y. Managing director: Clinton M. White.

Mar 12-14, International Acetylene Association: Annual meeting, Hotel Statler, Los Angeles. Association's address: 30 E. 42nd St., New York 17, N. Y. Secretary: H. F. Reinhard.

Mar. 12-15, National Electrical Manufacturers Association: Mid-winter meeting, Edgewater Beach hotel, Chicago. Association's address: 155 E. 44th St., New York 17, N. Y. Managing director: Joseph F. Miller.

Mar. 12-16, National Association of Corrosion Engineers: Annual meeting and exhibit. Hotel Statler, New York. Association's address: 1061 M & M Bldg., Houston 2, Tex. Executive secretary: A. B. Campbell.

Mar. 13-15, Radio-Electronics-Television Manufacturers Association: Spring meeting, Biltmore hotel, New York. Association's address: 777 14th St. N. W., Washington 5. D. C. Secretary: James D. Secrest.

Mar. 14-16, American Society of Mechanical Engineers: Aviation conference, Hotel Statler, Los Angeles. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Mar. 14-16, Pressed Metal Institute: Annual Spring technical meeting, Carter hotel, Cleveland. Institute's address: 3673 Lee Rd., Shaker Heights, O. Managing director: H. A. Daschner.

Mar. 18-20, American Machine Tool Distributors Association: Spring meeting, Hotel Statler, Detroit. Association's address: 1900 Arch St., Philadelphia 3, Pa. Executive secretary: Thomas A. Fernley Jr.

Mar. 19-20, Steel Founders' Society of America: Annual meeting, Drake hotel, Chicago. Society's address: 606 Terminal Tower, Cleveland, O. Executive vice president: F. Kermit Donaldson.

Mar. 19-21, American Society of Mechanical Engineers: Spring meeting, Multnomah hotel, Portland, Oreg. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Mar. 19-21, Society of Automotive Engineers Inc.: National production meeting and forum, Hotel Statler, Cleveland. Society's address: 29 W. 39th St., New York 18, N.Y. Secretary: John A. C. Warner.

Mar. 19-23, American Society of Tool Engineers: Industrial exposition and annual convention, International Amphitheatre and Conrad Hilton hotel, Chicago. Society's address: 10700 Puritan Ave., Detroit, Mich. Executive secretary: Harry E. Conrad.

Mar. 22-23, American Hot Dip Galvanizers Association: Annual meeting, Drake hotel, Chicago. Association's address: 1806 First National Bank Bldg., Pittsburgh 22, Pa. Secretary: Stuart J. Swensson.

Apr. 1-5, American Society of Mechanical Engineers: Oil and gas power conference, Jung hotel, New Orleans. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Apr. 3, Material Handling Institute: Spring meeting, Edgewater Beach hotel, Chicago. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson.

Apr. 3-4, Industrial Truck Association: Spring meeting, Edgewater Beach hotel, Chicago. Association's address: 900 F St. N.W., Washington, D. C. Secretary: William Van C. Brandt.

WIN $2000.00 IN THE WENDT-SONIS TOOL HOLDER "CUT COSTS" CONTEST

New! Different! Interesting! Easy too . . . and you win two ways in the Wendt-Sonis "Cut Costs" Contest. Who's eligible? Anyone employed by a company using the new superior Wendt-Sonis tool holder for throw-away inserts — a proven cost cutter. Keep a record on how you did it — how you "cut costs." Enter the facts on a simple-to-fill-out entry blank — send it to Wendt-Sonis Company for a chance at the prizes. Contest closes June 30, 1956. You win two ways — a chance at the prize — your job done at lower cost with Wendt-Sonis tool holders for throw-away inserts.

briefly — here's all you do . . .

1. Use the coupon below to get your entry blank and clear-cut easy-to-understand contest rules.
2. Be sure you have Wendt-Sonis tool holders for throw-away inserts on your job.
3. Jot down the facts and figures on the job for filling in the standard entry blank. You can base your example on lower tooling costs . . . less downtime . . . more parts per hour . . . *all* of these three . . . or any other savings you accomplished with Wendt-Sonis tool holders for throw-away inserts. Don't worry about neatness, spelling or size and type of job. Enter more than one job if you wish!

Don't be concerned about our using your name or company name in advertising. We wouldn't do that without getting your permission first.

$5000.00 IN PRIZES

1st $2000.00
2nd $1000.00
3rd $ 500.00
4th $ 250.00
and 25
$50 PRIZES
for
DOING YOUR JOB BETTER . . . AT LOWER COST

CONTEST JUDGES

John Greve
Executive Editor
Tool Engineer

Jerome S. Wilford
Executive Editor
Production Magazine

Elmer J. Tangerman
Executive Editor
American Machinist

GET YOUR SIMPLIFIED ENTRY BLANK RUSH!

CLIP — mail now!

"Cut Costs" Contest
Wendt-Sonis Co.
Dept. SM-356, Hannibal, Mo.

I want a chance to win in the Wendt-Sonis Tool Holder "Cut Costs" Contest. Rush me rules and entry blank.

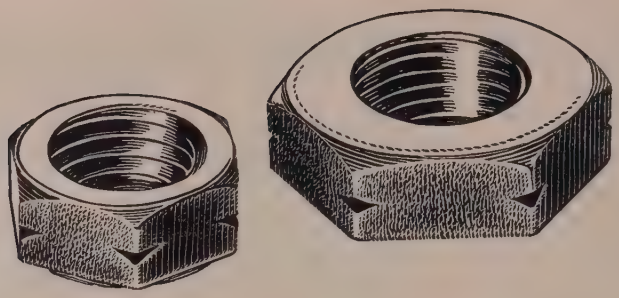
COUNT ME IN!

NAME _____ POSITION _____

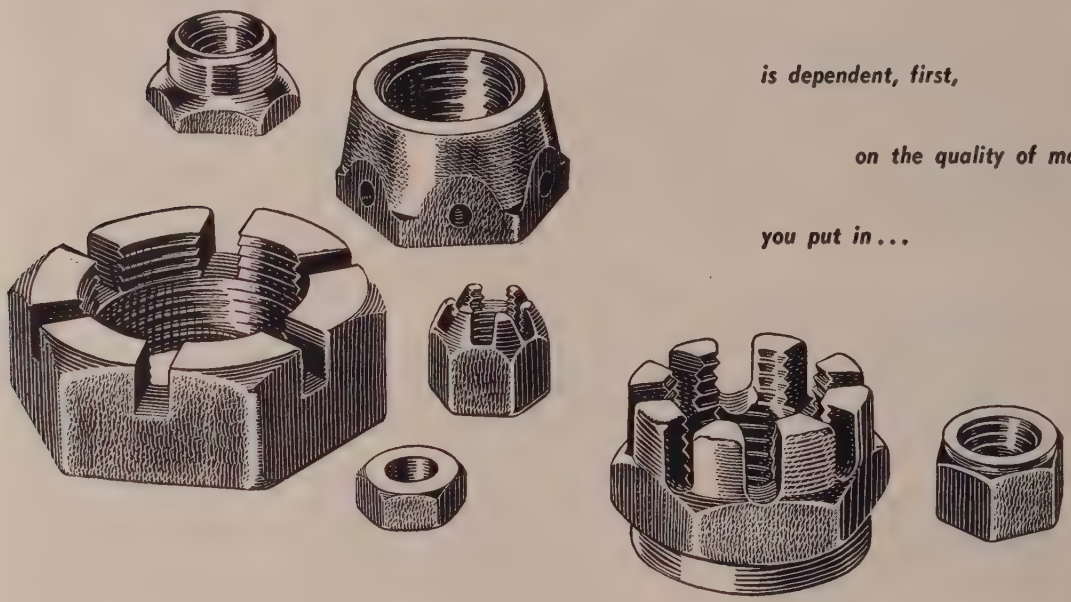
FIRM _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



the quality of product you get out of a machine –



is dependent, first,

on the quality of material

you put in . . .

The expression, "mass perfection", might well be applied to nuts of the quality illustrated above. Some are simple, others complicated. But, all bear the unmistakable mark of quality—a mark inherent in the products produced from Youngstown Cold Finished Bars.

There are no stringy chips to get caught in the cut-off blade on an automatic; they're small and break off easily. In fact, you can eliminate most grinding operations.

Youngstown Cold Finished Bars have that desirable uniformity and machineability. They are free of injurious seams. Cracked steel rarely turns up. If you use automatics, it will pay you to get in touch with your nearest Youngstown District Sales Office.

QUALITY YOUNGSTOWN SERVICE

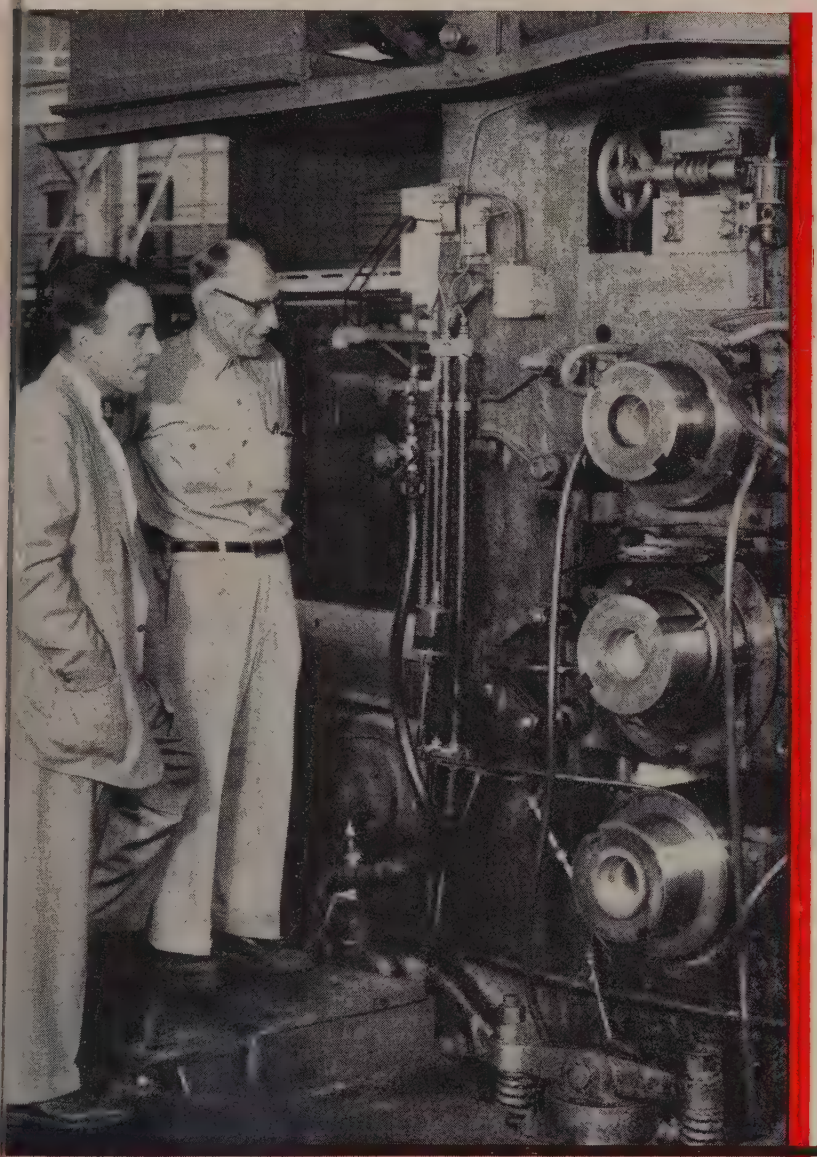
Youngstown Cold Finished Bars

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

Sick slab roll recovers fast with application of STANOGEAR Compound



Eugene Ewald (right), Mill Foreman, and Marshall Fox, Standard Oil lubrication specialist, inspect slab roll. STANOGEAR Compound helped solve lubrication problem on roll neck bearings.

Marshall Fox who proposed switch to STANOGEAR with resultant improved operation, is experienced in providing such technical service. Marsh has a Mechanical Engineering degree from Purdue to qualify him for this work. In addition, he has completed Standard's course for sales engineers. This experience and training, customers find, pay off *for them.*

A slab roll at Matthiessen & Hegeler Zinc Company, La Salle, Illinois, was sick. It suffered from repeated roll neck bearing failures. Bearing temperatures couldn't be controlled. A consultant was summoned—Marshall J. Fox, Standard Oil lubrication specialist. His diagnosis and remedy: Install STANOGEAR Compound and equip the machine with a central pressure system for application. Recommendations were followed. Result: No bearing failures, due to faulty lubrication, since. Maintenance costs reduced. Time lost through breakdowns slashed.

This was a condition made to order for STANOGEAR to remedy. And Matthiessen & Hegeler knew there was a man at hand who could suggest what should be done. It's another demonstration of what this unbeatable combination can do when put to work:

1 **Standard Oil lubrication specialists capable of giving technical help.**

2 **Top quality products *that deliver results required.***

STANOGEAR Compounds contain special additives making them suitable for applications where heavy loads cause welding, seizure or scoring.

In the Midwest and Rocky Mountain states, a Standard Oil lubrication specialist in your nearby Standard Oil office will gladly give you more information about STANOGEAR. Call him. Or contact Standard Oil Company, 910 So. Michigan Avenue, Chicago 80, Ill.

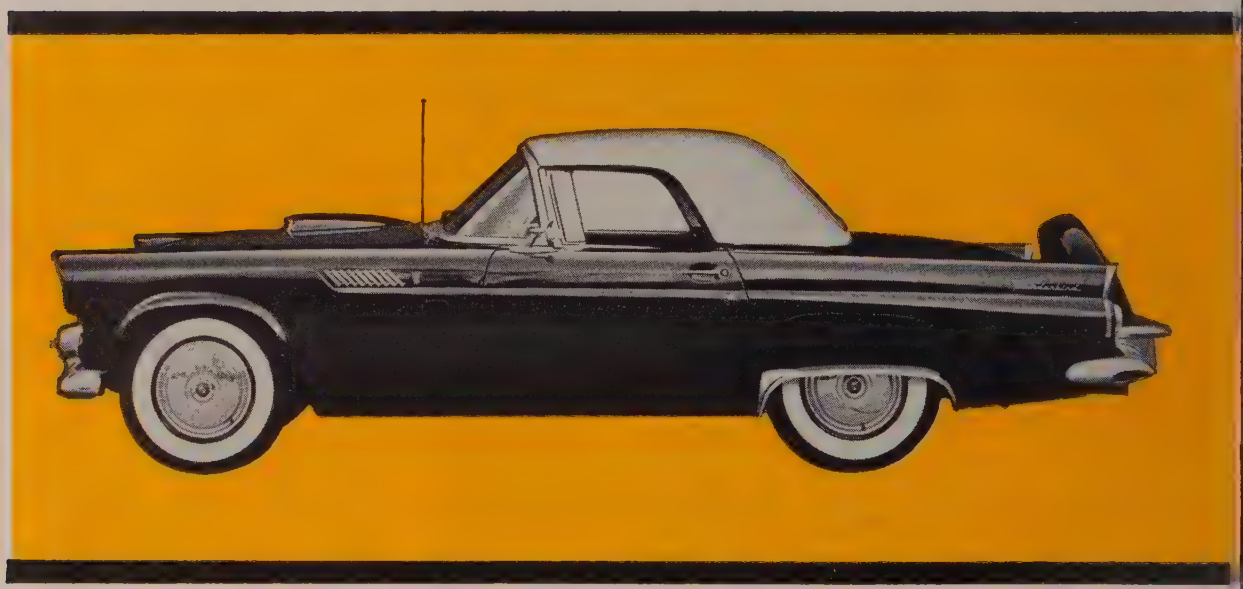
STANDARD

STANDARD OIL COMPANY

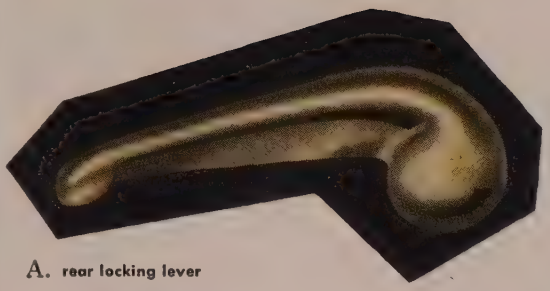
(Indiana)

MUELLER BRASS CO. FORGINGS

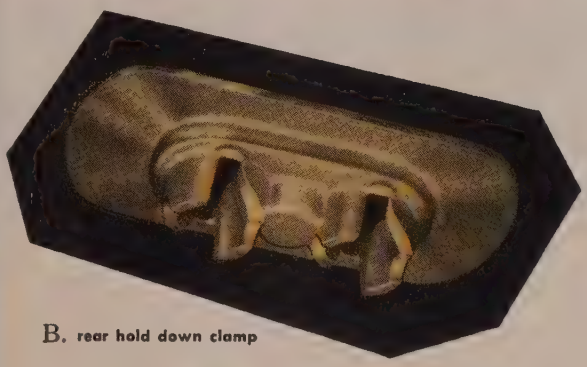
give THUNDERBIRD tops a snug fit the year around



The Motor States Products Division of Detroit Harvester Co.—a major supplier of top assemblies for convertibles—has found Mueller Brass Co. forgings an ideal answer for securely fastening down the tops on the Ford Thunderbird. In a summer shower or in the snow of winter the top is always snug and draft-free. There are a pair of each of the three Mueller Brass Co. forgings shown here used in locking the Thunderbird top securely around the sides and rear deck. The locking lever (A) is incorporated in the top and operates a locking pin that fastens into the rear hold down clamp (B). A pair of side hold down clamps (C) are located just behind each door opening and clamp fasteners on the top hook into these forgings to rigidly hold the top in position. These forgings hold the necessary close tolerances and provide an excellent surface for buffing and chrome plating. In addition, the price is favorable and deliveries are good. For these reasons, as well as their inherent strength and durability, a switch to Mueller Brass Co. forgings can prove advantageous. Write today for our engineering manual (No. H-58565) . . . or better yet, call in one of our engineers to investigate possible forging applications in your products.



A. rear locking lever



B. rear hold down clamp

C. side hold down clamp

WRITE TODAY FOR THE ENGINEERING MANUAL YOU NEED

Mueller Brass Co. Forgings Engineering Manual H-58565 ☐

Tuf Stuf Aluminum Bronze Alloys Engineering Manual H-58563 ☐

600 Series Bearing Alloys Engineering Manual FM-3000 ☐

Copper Base Alloys in Rod Form Engineering Manual FM-3010 ☐

METALS AND ALLOYS REVIEW

by FRANK M. LEVY, Director of Research

The other day one of our sales engineers stopped in to discuss gear applications and the subject got around to the amount of zinc permissable in gear and bearing alloys. Engineering books state that zinc is not desirable in bearing alloys. While this statement is true as regarding the commonly used copper-tin and copper-tin-lead alloys, it does not necessarily apply to other types of alloys. The 600 series bearing alloys, in which I am keenly interested, depend upon a high zinc content along with several other metal constituents to provide them with their fine bearing properties.

My explanation to our sales engineer was somewhat as follows: The question as to whether or not zinc is detrimental in a bearing alloy depends upon the remaining constituents in the alloy. A comparatively small amount of zinc is detrimental in a phosphor bronze alloy containing 80% copper, 10% tin and 10% lead. A zinc content of 4% is permissible in a bearing alloy containing 88% copper, 4% tin and 4% lead when used in an application not subject to heavy loads. In these alloys the tin combines with some of the copper to form a hard copper-tin constituent which is distributed through the soft copper matrix, or mat of copper. The higher the percentage of tin present, the greater the quantity of hard copper-tin constituent formed. Zinc also combines with copper increasing the hardness of the matrix. Therefore, when zinc is present along with a high tin content, the matrix becomes too hard and is "out of balance" resulting in poorer bearing qualities.

In the 600 series, copper, silicon, manganese, etc., are present with zinc. There is sufficient manganese present to combine with the silicon to form a purple manganese silicide which is embedded in the copper-zinc matrix. *Since the manganese-silicide constituent has a much higher micro hardness than the copper-tin constituent in phosphor bronze, the matrix of the 600 series alloys can have a higher hardness without impairing the bearing properties. In this instance, zinc is not detrimental but desirable because it produces an alloy with a high Brinell hardness which resists pounding and distortion.*

Like many engineers, we, too, were skeptical of the bearing properties of the first 600 alloy developed. A manufacturer of worm driven truck transmissions was having difficulty with the failure of chill cast high tin bronze gears in busses used in the hilly section of Los Angeles and Pittsburgh, and solved his problem by using gears made from 600 metal.

Since that time, we have had over a hundred successful applications on difficult bearing problems where cast bearing bronzes have failed. An interesting observation is that once a customer uses 600 alloys, he not only finds other applications, but continues to use it over a long period of years. Our original customers are still on our books.

In conclusion, we agree that zinc is detrimental to the bearing properties of the phosphor bronze type of alloys, but is of benefit to the 600 series alloys, *as it makes a harder matrix*, permitting the alloy to resist pounding action better than the softer phosphor bronze alloys.

I've just about run out of space for this time but we'll have another subject for discussion later. If you have any problems or questions about non-ferrous alloys, just write me here at Mueller Brass Co. and we'll see what we can do.

MUELLER BRASS CO.

PORT HURON 19, MICHIGAN

170

want more attention?

Want a special-steel supplier that gives every attention to even the smallest orders? Then come to Crucible! In each warehouse of our nationwide chain, you'll get a complete selection and prompt service—whether you order by the pound or ton.

So for prompt service and a complete line of special purpose steels, fill all your requirements at Crucible—*big enough to serve you, small enough to want to.*

Stocks maintained of:

Rex High Speed Steel... ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, HY-Tuf, AISI Alloy, Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

Crucible Steel Company of America

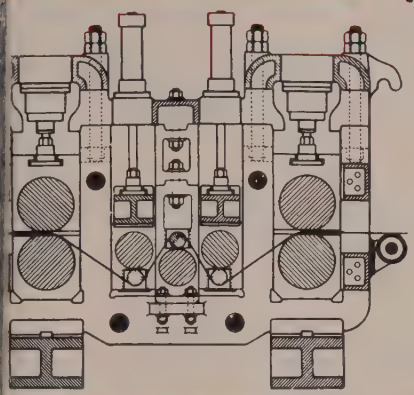
TRIPLE SCALE BREAKER

Speeds Pickling with the New

"YOUNGSTOWN"

High Speed Continuous Strip Pickling Line

...Better Pickling with Less Acid and Lower Cost!



See our new, pull thru type, TRIPLE SCALE BREAKER, —a revolutionary improvement that eliminates the need for a Pinch Roll Stand in a modern Pickling Line. Investigate this and other new "YF&M" advantages. Whatever your pickling requirements,—complete new lines, revamping of existing lines, new tanks, rubber-covered rolls, Paralloy pinch rolls, any pickling line equipment,—get the benefit of our 70 years' experience. Consult "Youngstown" on how to speed up your pickling, cut acid consumption and make your operation more profitable.

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- Fume Exhaust System —Roto Clone Scrubber.
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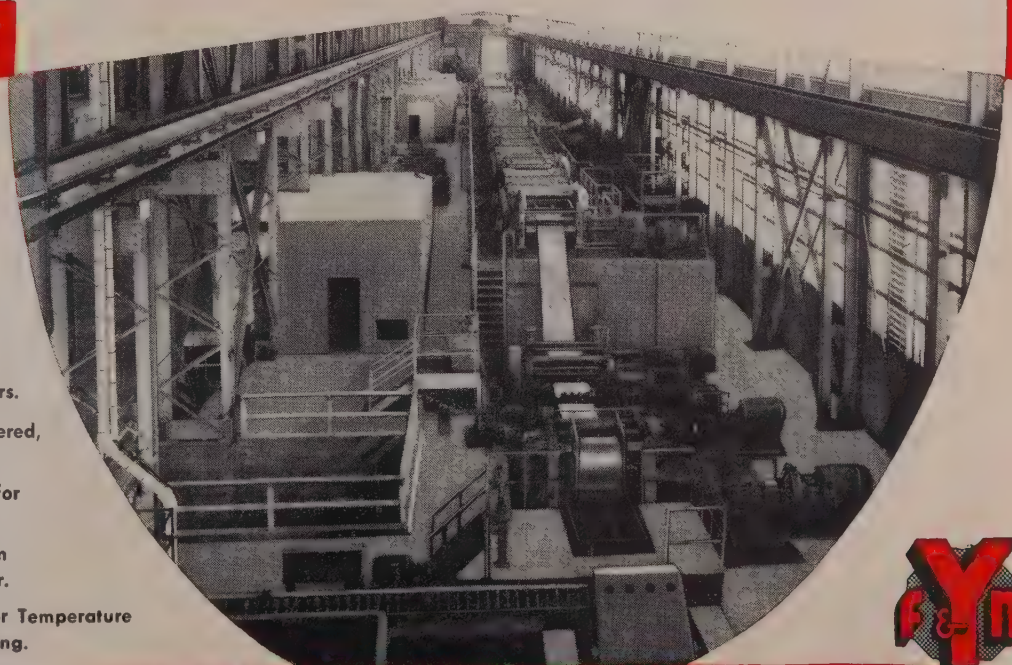
- Up-Coiler with Strip Oiling System.
- Entry and Exit Coil Conveyors.

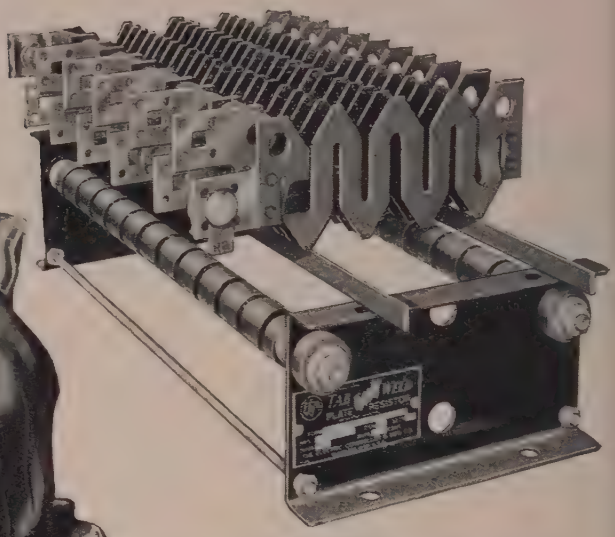


The Youngstown Foundry & Machine Co.

SERVING INDUSTRY SINCE 1885

Youngstown, Ohio

when resistor problems arise...



- NEGLIGIBLE CHANGE—HOT OR COLD
- NON-BREAKABLE
- HIGH CAPACITY
- NO BURNING AT GRID-EYES
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- STOCK SIZES
- MANY TAPS FOR EASY ADJUSTMENT
- CORROSION-RESISTANT

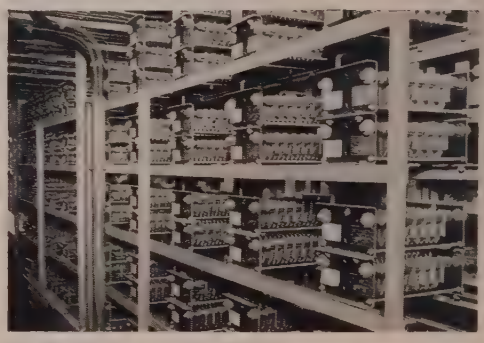
Remember

ALL CONDITIONS CAN BE MET WITH ONE TYPE...THE EC&M *TAB WELD* PLATE RESISTOR

What resistor section will give the most advantages ... the easiest to select ... to install ... to save manpower maintenance!

EC&M TAB-WELD Resistors simplify these problems ... *One style* combines all the advantages of previous resistor-designs ... easy tap-changing ... non-breakable ... corrosion resistant ... and wide range of ampere capacities. And there is NO BURNING at grid-eyes or at tap-plates ... TAB-WELD construction maintains a constant current-carrying path independent of end clamping-nut pressure.

Look into EC&M Bulletin 942 TAB-WELD Resistors for economy in selection and performance. This one source meets all conditions efficiently.



Standardization on TAB-WELDS provides many advantages for this mill.

On mill controllers, cranes and charging machines in this plant, EC&M TAB-WELD Resistors have operated trouble-free for several years. Standardization on these resistors has saved manpower ... and cut maintenance costs.

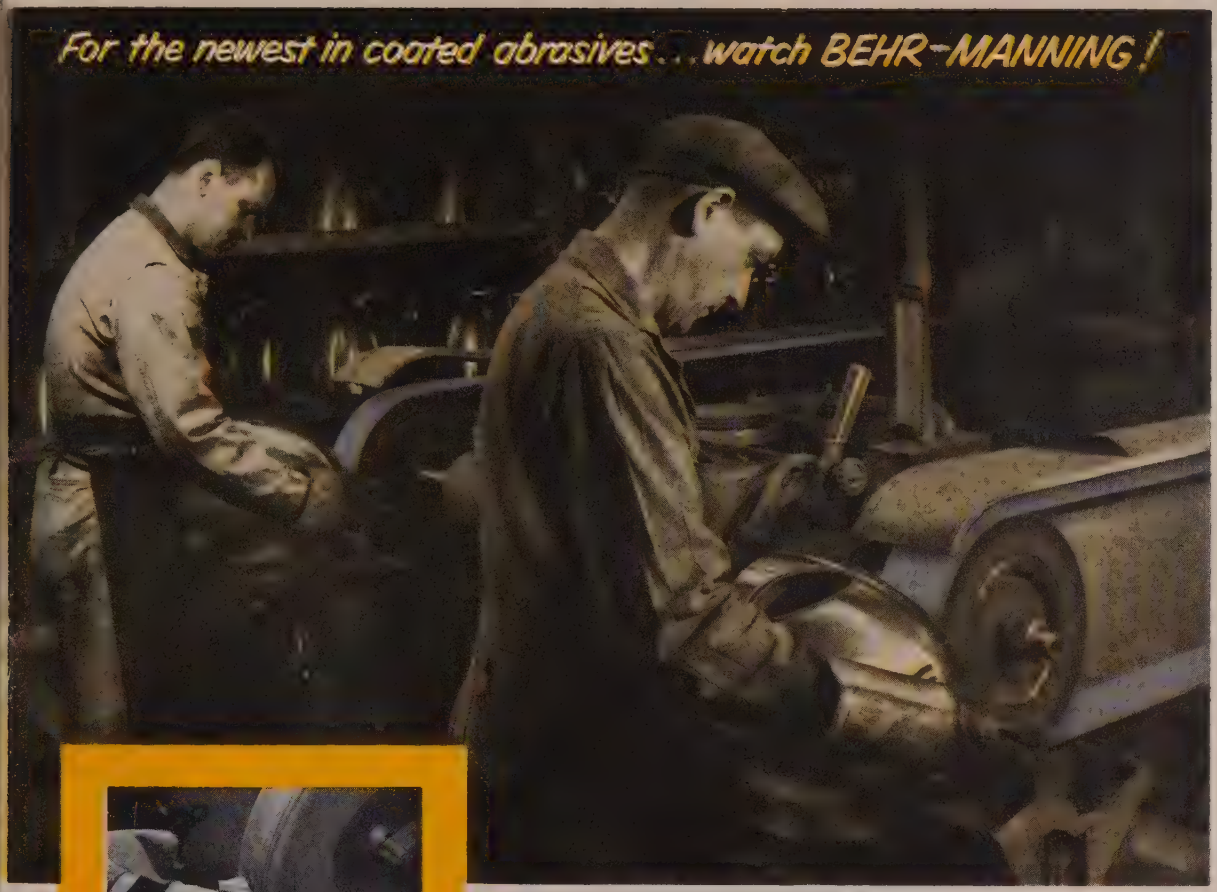
6821

THE ELECTRIC CONTROLLER & MFG. CO.

Division of Square D Company

4498 Lee Road • Cleveland 28, Ohio

For the newest in coated abrasives . . . watch BEHR-MANNING *!*



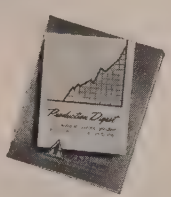
A favorite for dry fining and blending plumbing parts.

Tops for removing flash from difficult inside contours.

Contour polishing fluted areas of bits on 1/2" free-running belt.

Spinning-off faster, better finishes

With BEHR-MANNING Coated Abrasive Belts on the job, it's easy to bring-up superior finishes on difficult contours. For example, spin polishing hair-dryer domes (above) on smooth-cutting abrasive belts has proven a highly productive and efficient operation. Test these versatile, BEHR-MANNING Abrasive Belts on your parts — in your plant or in a nearby BEHR-MANNING Demonstration Room. Write for the Production Digest Bulletin. Contains 60 pages of detailed data on coated abrasive grinding and polishing techniques. Address Behr-Manning, Troy, N. Y., Dept. S-3.



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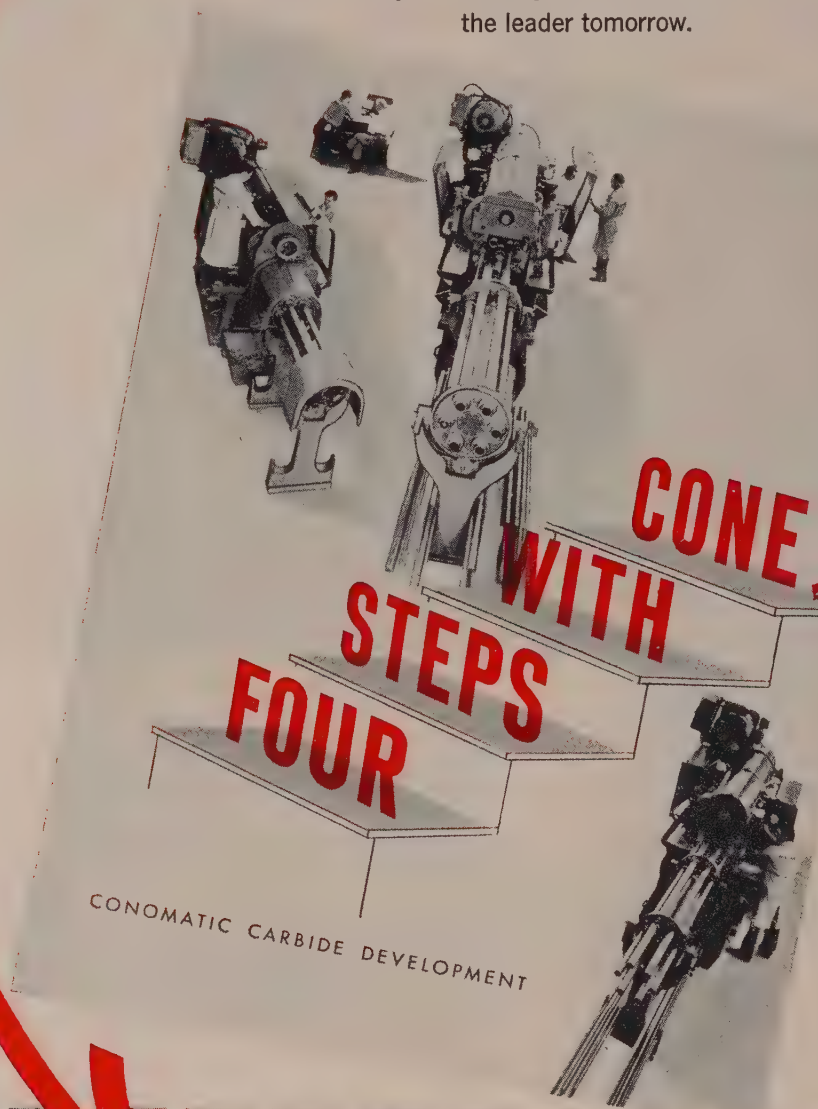
BEHR-MANNING

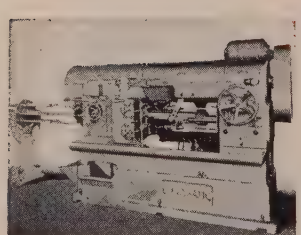
division of NORTON Company

▲ COATED ABRASIVES
▲ SHARPENING STONES
▲ PRESSURE-SENSITIVE TAPES

If you haven't read this important booklet, your production line may be operating at less than peak efficiency. Your operations may be beating competition with HSS today, but you will likely need carbide tooling to be the leader tomorrow.



Write for your free copy of this important booklet today!

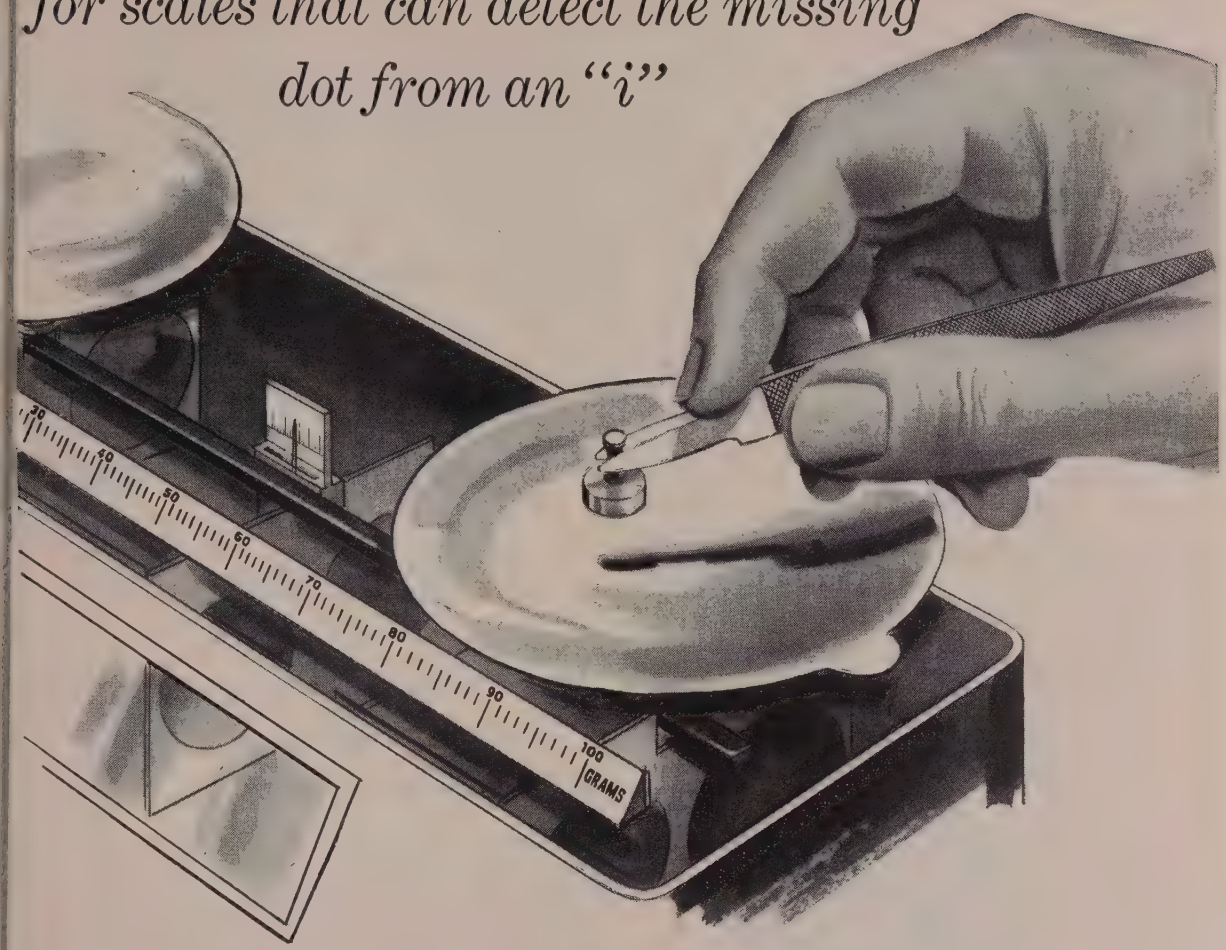


Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

WE ROLL METAL

for scales that can detect the missing dot from an "i"



• Scale makers have borrowed a new kind of alloy used for springs in the finest watches—metal far springier than the finest steel. We call it Nilcor* . . . and produce it in widths from ⅛″ to 1⅜″, .0025″ to .025″ thick.

It's so hard and tough that only the finest, most advanced mill equipment and techniques can process it. Yet it is the most perfect material known for making the precision torsion bands used in laboratory scales . . . with more precise characteristics . . . greater stability . . . unmatched resistance to corrosion . . . longer life under repetitive bending.

Despite the difficulty of working Nilcor, the *Athenia Steel Division* of National-Standard gives it up to an 85% reduction and maintains tolerances as close as .0001″.

It is this kind of ability that enables Athenia to develop practical applications of unique Nilcor and also makes Athenia a foremost supplier of special high carbon strip steel.

If you think you have a particular application requiring Nilcor, or if you need strip steel with unusual demands for tolerance, flatness, edge forming, uniformity, temper and other characteristics, try *Athenia*. And remember, small company or big company, we are eager to serve you. Write us.

*Trade Mark, National-Standard Company.

NS
NATIONAL-STANDARD Company
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Tire Wire, Stainless, Fabricated Braids and Tape
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CHIPS DISSTON SAYS

"Be a Sharp Buyer!"

Choose the new DISSTON *Lancer Tooth Band Saw*

FOR HIGH-SPEED CUTTING OF NON-FERROUS METALS

LANCER TOOTH

Use this newly designed Disston hard edge blade with positive rake angle tooth. It permits high-speed production cutting of non-ferrous metal, wood and plastic—cuts brass and aluminum solids and Plexiglas with equal ease.

REGULAR TOOTH

Use this fine Disston hard edge flexible back band saw for all ferrous metals and the thinner sections of non-ferrous metal, wood and plastic. Its finer tooth spacing is particularly adapted to sawing angle iron, steel tubing, nickel plate and brass sheets.

Contact your Disston distributor for these and other high quality Disston cutting tools. Get his expert advice on selecting the right tool for your application.

Henry DISSTON DIVISION
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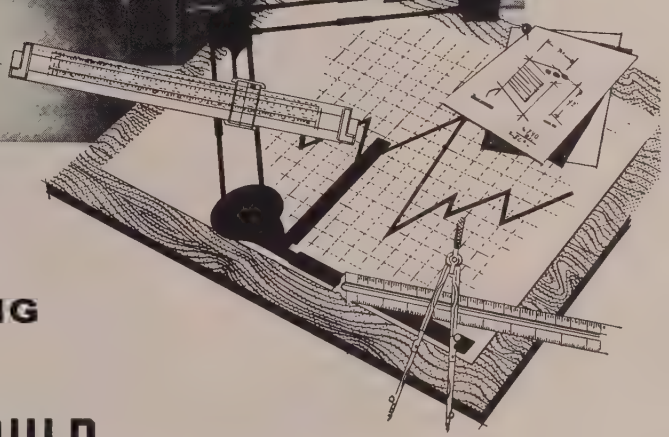
HKP DISSTON



PLENTY OF ENGINEERING KNOW-HOW GOES INTO GOULD RESEARCH BUILT BATTERIES!

On the drawing boards in the Gould engineering department, theory is made practical. Drawings and specification charts indicate the right plate size, battery case size, the eventual battery capacity, how grids should be cast, how active material should be mixed and how the battery should be constructed—to make sure you get the right battery for the right job! One more reason why you get better batteries first from Gould!

America's Finest!
GOULD
Industrial Truck Batteries

"BETTER BATTERIES THROUGH RESEARCH"

Always Use Gould-National Automobile and Truck Batteries

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GOULD-NATIONAL BATTERIES, INC.
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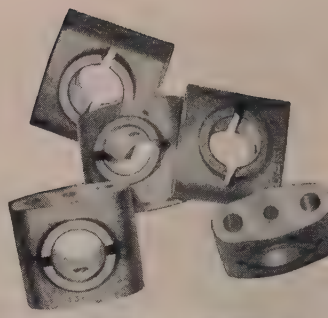
AUTOMATED BROACHING

BALANCED PRODUCTION

with two machines



ANOTHER

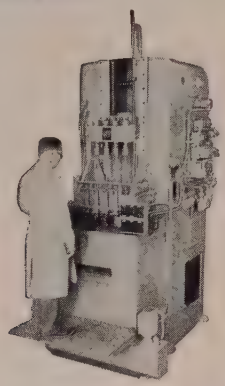
American

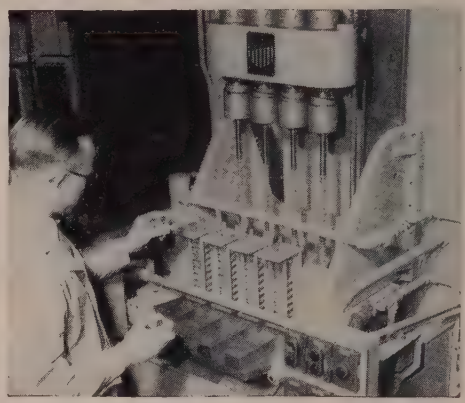
FIRST

This "working team" of two American Broaching Machines produces 3,000 rocker arm brackets per hour.

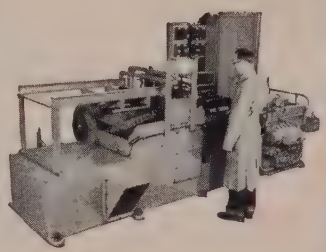
An American (VP) vertical hydraulic internal pull-up broaching machine, arranged for 4-station operation, broaches the ¾" diam. hole in the part. The part is then conveyed to a hydraulic broaching machine, which straddle broaches the sides of the parts. The feeds, broaching strokes and ejectors of the two machines are completely automated to provide continuous, balanced production.

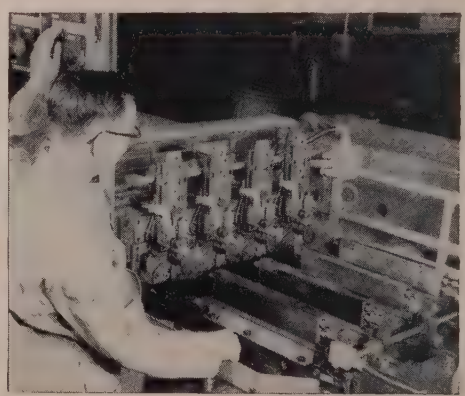
American machines, broaches and fixtures are made in sizes and types to fit your exact requirements. Why not let American engineers solve your broaching problems. Send a part print or sample. Ask for Catalog No. 450.



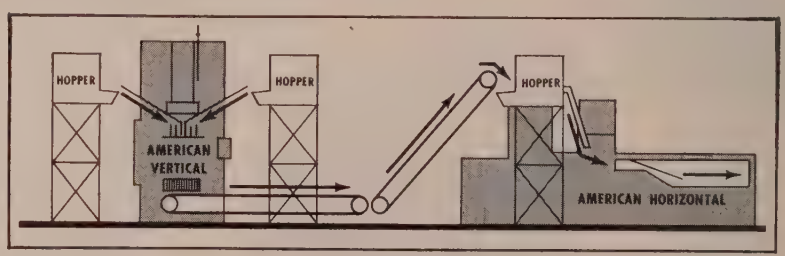


At the vertical machine, the die-cast aluminum parts are fed from hoppers into magazine feeds, the hole is broached and the parts automatically ejected onto a conveyor. Cycle is continuous.





Expanding arbors of the horizontal machine pick up the parts from magazine feeds and push them past stationary broaches which straddle broach the sides. Parts are ejected automatically on the return stroke.



AMERICAN

American BROACH & MACHINE CO.

A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

ANN ARBOR, MICHIGAN

SUNDSTRAND

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

Weirzin's tightly bonded zinc coating takes the deepest draws with ease—does not crack, peel or flake under the severest fabricating operations.

Weirzin's malleable zinc coating lubricates dies without leaving a zinc deposit—reduces die maintenance—increases die life.

Weirzin, chemically treated, takes and holds paint, enamel, lacquer and lithographic ink indefinitely—eliminates underfilm corrosion.

Weirzin stops inventory losses due to rust—eliminates pickling—reduces cleaning and buffing—cuts handling before, during and after fabrication.

How to wrap up product superiority...at lower cost

Weirzin

electrolytic zinc-coated sheet

No matter how extreme the stresses of fabricating operations, electrolytic zinc-coated Weirzin stands up under them. Its tightly bonded malleable coating flows so smoothly with the ductile steel base during a deep draw that Weirzin seldom needs additional coating for corrosion protection.

Here is a different kind of steel sheet. For ease of fabricating, for durability, for long-range economy, no other "similar" metal measures up to Weirzin. Weirzin is produced in a continuous strip up to 36" wide. It is available in coils or cut lengths down to ½" strip—gauges .010 to .0478. Phone or write now for the money-saving, customer-pleasing facts about Weirzin!

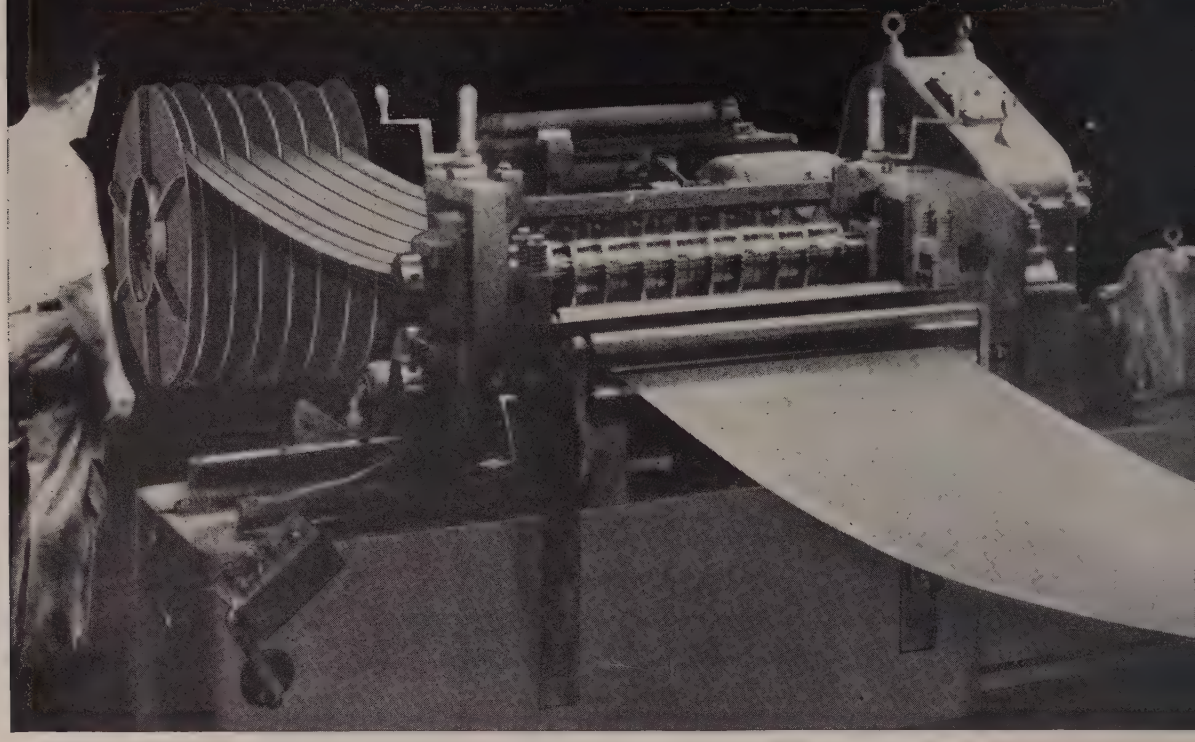
WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

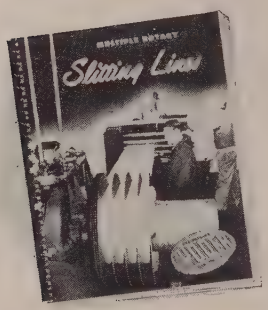
a division of

NATIONAL STEEL CORPORATION

AN EFFICIENT SLITTING LINE



...with big savings possibilities



The Yoder Slitter Book contains time studies, production records, and other valuable data on the economics as well as mechanics of slitter operation. A copy is yours for the asking; also estimates and recommendations.

The standardized series of Yoder Uncoilers, Slitters and Recoilers make possible an infinite number of combinations for highly efficient coil and sheet slitting.

At a substantial saving in first cost, one of these combinations will meet widely varying production needs of fabricating shops as efficiently as higher priced, built-to-order equipment (also designed and built by Yoder) for very big tonnage requirements.

A Yoder standardized slitting line is a most profitable production tool which will pay for itself in short order on strip requirements as low as 100 tons per month, even less. Equally important is the ability in a few hours to meet expected and unexpected needs for slit strands, from a relatively small stock of standard width coils. This greatly reduces strip inventories and simplifies production planning.

THE YODER COMPANY • **5502 Walworth Avenue, Cleveland 2, Ohio**

ENGINEERING YODER MANUFACTURING

ROTARY SLITTING LINES

COLD ROLL FORMING MACHINES

ELECTRIC-WELD PIPE AND TUBE MILLS

UNCERTAIN OPERATING COSTS BOTHER YOU?

depend on the only

long range economy fuel

You'll win in the long run by burning Bituminous! Today and tomorrow, supply is unlimited and the vast reserves are right on the threshold of the major manufacturing centers. Bituminous, too, has the highest potential for cost improvement among competing industrial fuels. Year in and year out new methods and machines are designed to control costs and improve burning efficiency.

Let B&O's Technical Service fit this fuel to your long range power plans.
Ask our man!

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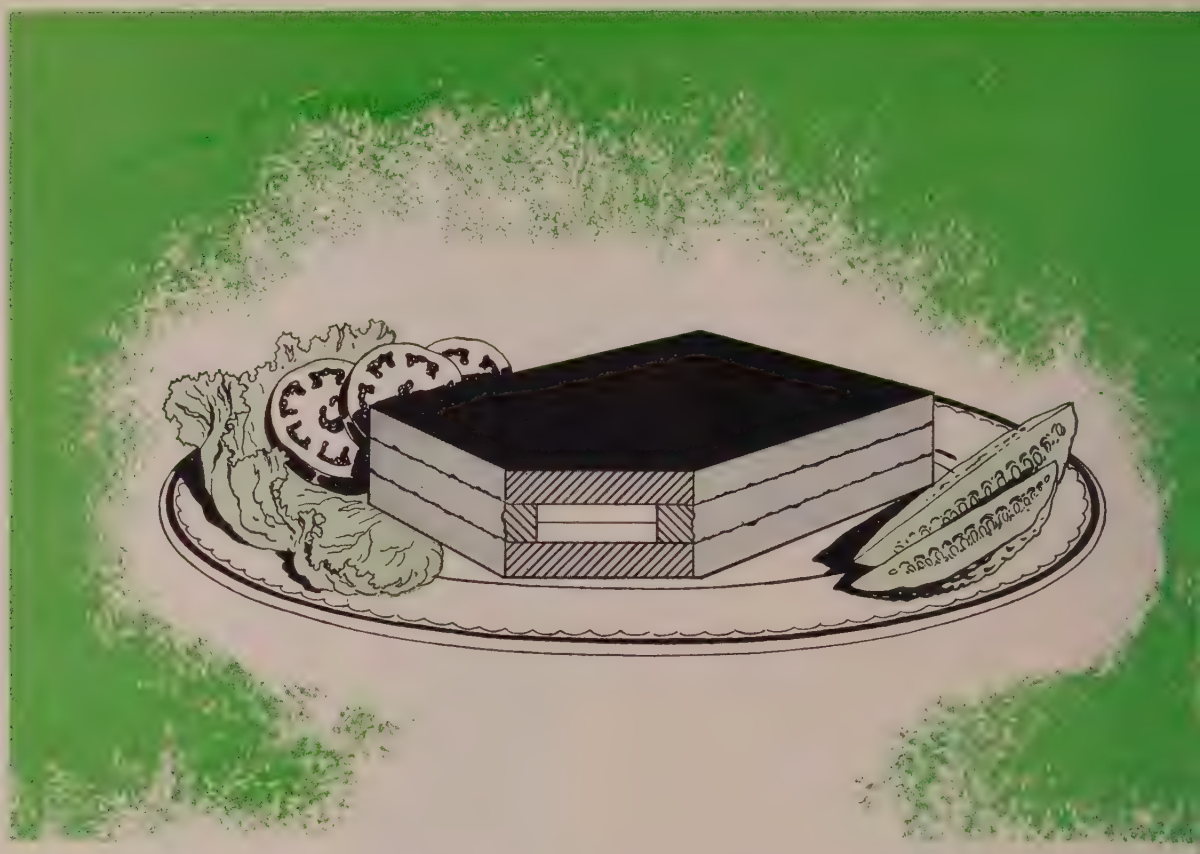
BITUMINOUS COALS FOR EVERY PURPOSE



here's the sandwich that saves you money*

*
As you know, a "sandwich" is merely the unit, consisting of two stainless plates between two carbon or alloy steel plates, which is assembled and rolled into stainless-clad plates.

When you buy *this* sandwich, you get all the benefits of solid stainles steel—for less cost.

Claymont Stainless-Clad Steel Plates give you all the corrosion an contamination resistance of stainless steel where protection is needed and the economy of carbon steel where strength is required. You ca specify the cladding in any percentage your process requires—fro 5% to 50% of the total plate thickness.

So if you fabricate or use equipment where product contamination corrosion is a problem—if you are looking for stainless steel protectio at lower cost—you can use Claymont Stainless-Clad Steel Plates good advantage. For full details, contact the nearest sales office show below, or write direct to Wickwire Spencer Steel Division, The Colorad Fuel and Iron Corporation, P.O. Box 951, Wilmington, Delawar

CF&I **Claymont Steel Products**

Products of Wickwire Spencer Steel Division · The Colorado Fuel and Iron Corporation

35

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Carbon and Alloy Steel Plates · Flanged and Dished Heads · Manhole Fittings and Covers · Large Diameter Welded Steel Pipe · Flame Cut Steel Plate Shapes · CF&I Lectro-Clad Nickel Plated S

No down time in 16 months!

That's the record of this 20-ton Plymouth Diesel owned by Wyatt Metal & Boiler Works, Houston, Texas

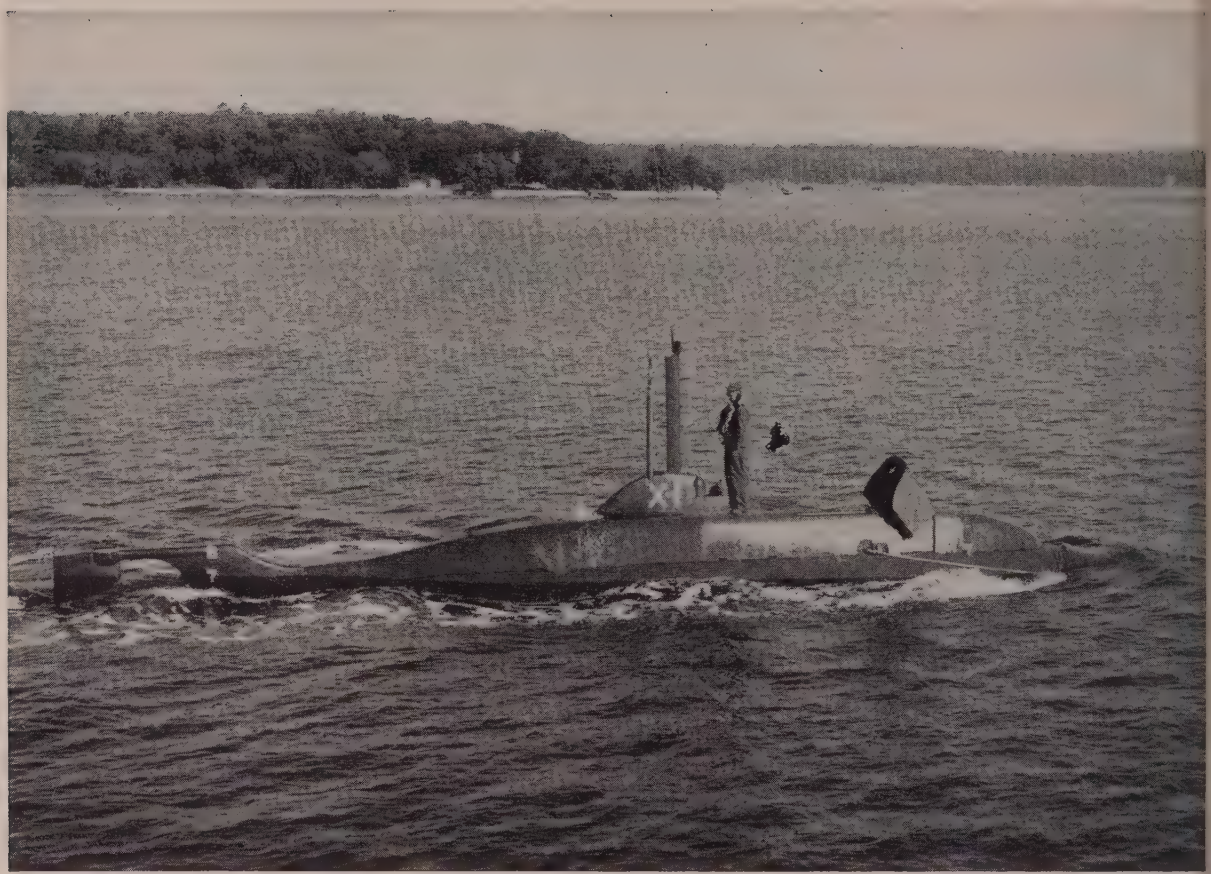
This modern Plymouth operates approximately 45 hours a week, hauling, switching and spotting railroad cars in the plant. The operator praises the Plymouth Torqomotive* Drive because it eliminates shifting gears under heavy loads, assures smooth, steady power for peak efficiency, and reduces rough starts and coupling shocks.

"There just isn't anything we have found wrong with our Plymouth," says E. C. Jones, Vice President of Wyatt. "Efficiency in switching has doubled, and we have lost no time due to repairs or maintenance since we purchased the locomotive 16 months ago. It is far above anything we have had experience with."

If you are not enjoying the benefits of "Industry's Smoothest Switchers" write for illustrated catalog of the Plymouth line—models from 3 to 70 ton. Gasoline or Diesel, Mechanical or Torqomotive Drive. Also Diesel-Electric. PLYMOUTH LOCOMOTIVE WORKS, Division of THE FATE-ROOT-HEATH COMPANY, Dept. A-1, Plymouth, Ohio.

*TORQOMOTIVE DRIVE: PLYMOUTH TRANSMISSION COUPLED TO A HYDRAULIC TORQUE CONVERTER

PLYMOUTH® TORQOMOTIVES



"**Rigged for diving**", the Navy's new 4-man experimental submarine, USS X-1, heads for deep water. Built by Fairchild Engine Division, Deer Park, New York, many vital parts of this boat are made of corrosion-resisting Inco Nickel Alloys.

Undersea "*ferret*"

for close-in attacks on harbors and shipping

You are looking at the Navy's new 4-man midget submarine, USS X-1.

It is only 50 feet long. Diameter 7 feet. Displacement 25 tons. A unique and nimble offensive weapon for testing U. S. harbor defense and performing missions larger subs simply cannot do.

But its very compactness posed a perplexing problem. Major alterations and repairs were bound to come up on this experimental boat. How were they to install or remove equipment that was too large to pass through the hatch?

A unique solution occurred to Fairchild engineers: build the pressure hull in sections and bolt them together. Then the hull could be easily disassembled for alterations, repairs, or even shipment over land.

But this led to a second problem: what alloy to use for the bolts. It had to be corrosion-resisting, of course. But more than that, it had to be strong enough to hold the pressure hull tightly together even when the boat was submerged.

They found the answer in "K" Monel age-hardenable nickel-copper alloy. It is outstandingly resistant to marine corrosion. And it can be age-hardened to a tensile strength of 130,000 to 200,000 psi.

Because of the Navy's previous successful experience with Monel and Nickel, in resisting corrosion by salt water, these alloys are used in many other parts on this submarine. Grease fittings. Plumbing. Pumps and pump parts. Diving gear, including universal joints. Exhaust valves. Engine accessory apparatus. Rings. Springs.

Do you need a strong metal that will resist corrosion? Wear? High temperatures? Or provide some unusual electrical property? Then write for our handy guide to more than 20 alloys developed specifically to give longer, better service under destructive conditions. Called "Standard Alloys for Special Problems," this 16-page booklet is yours for the asking.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO Nickel Alloys

*Trade Mark of The International Nickel Company, Inc.

MONEL* • "R"* MONEL • "K"* MONEL • "KR"* MONEL • "S"* MONEL • INCONEL* INCONEL "X"* • INCONEL "W"* • INCOLOY* NI-O-NEL • NIMONIC* ALLOYS • NICKEL LOW CARBON NICKEL • DURANICKEL*

Metalworking Outlook

Nine States Approve SUB

The auto industry's SUB plan will go into effect June 1 as scheduled. Operation of the layoff program had been contingent on rulings by states in which two-thirds of employees of each auto company work. The rulings had to provide that private payments could be made concurrently with state unemployment benefits. Michigan, Massachusetts, Connecticut, Delaware, New York, New Jersey, Pennsylvania, Florida and California have made favorable decisions.

Wage Hike for 2 Million

On Mar. 1 about 2 million workers got wage boosts to bring their earnings up to the new federal minimum hourly rate of $1. Major impact on the economy will be in the South. There, says Commerce Clearing House, an estimated 28 per cent of affected workers in manufacturing will be raised. In the Northeast, 8 per cent will be raised; 4 per cent in the Midwest; and 2 per cent in the Far West. Few metalworking employees are involved. Most are in textile, lumber, leather and food processing industries.

Steelworkers Meet

The wage policy committee of the United Steelworkers meets Mar. 6 and 7 in Chicago. Nothing formal will come out of the sessions, but groundwork for demands to be mapped later will be laid. Because of the steel industry's good profits in 1955 and thus far this year, the demands will probably be large. Major ones: Higher pay, SUB, premium pay for weekend work and full union shop.

Educational Industry

An increasing number of companies are offering tuition-aid plans for employees, yet less than 5 per cent of those eligible take advantage of the offer. Those are findings by the National Industrial Conference Board in a study of 166 company programs. Nearly one-third of the 166 began their programs in the early 1950s. All 166 give financial aid for job-related courses, and most firms also permit other subjects. Most of the aid for nonrelated courses goes for cultural subjects, such as English and foreign languages and others leading to college degrees.

The Executive Reserve

Look for federal agencies having essential wartime functions to start soon in recruiting executive reservists for emergency duty. A reservist must have "broad experience in production, manpower, transportation, etc." He must also: 1. Be willing to attend a training course at least once a year. 2. Be immediately available for assignment in case of mobilization. 3. Have the consent of his employer. 4. Notify the agency concerned of any changes in his availability.

Changes in Steel

Watch this significant technical change that Inland Steel Co. is considering: It is studying continuous casting machinery to produce semifinished

Technical Outlook—p. 91 Market Outlook—p. 139

steel. Inland's program (see page 62) originally included another blooming mill, but that project will be suspended, pending the study of continuous casting.

Integrated Western Plant?

U.S. Steel Corp. has plans for an integrated steel mill at its Columbia-Geneva Steel Division's Pittsburg, Calif., plant, but it may be as much as ten years away. The corporation bought some 600 acres adjacent to its plate and sheet plant early in 1955. The only integrated facility on the Pacific Coast is Kaiser's Fontana, Calif., mill.

Help for Argentine Steel

It looks as though Argentina's $258-million integrated steel mill may finally get started. Export-Import Bank, Washington, has agreed to finance 60 per cent of purchases made for it in the U. S. Equipment bought here will cost some $100 million. Armco International Corp., Middletown, O., Arthur G. McKee & Co., Cleveland, and Westinghouse Electric International Co., New York, helped design the mill. It will have a 1300-ton blast furnace, by-product coke ovens, blooming and billet mills, rail and structural mills and facilities for plate, sheet, strip and tin plate. Ingot capacity will be 613,000 net tons yearly.

Progress in Titanium

Marked price reductions on titanium sheet and other products may be in the cards. "If conversion of titanium pig to sheet were as efficient as the same process in aluminum, titanium sheet would sell at $9 a pound., compared with its present cost of $17 to $18," points out Cramet Inc., Chattanooga, Tenn. Cramet, whose 300-ton, double-melting furnace will soon be in full production, plans to make available a full range of mill products. Special attention will be given to small extrusions in a wide range of shapes. Sheet, strip, wire and rod will be available also. Annual consumption of up to 20,000 tons of titanium within a few years is likely, experts believe.

Straws in the Wind

Wheeling Steel Corp., Jones & Laughlin Steel Corp. and International Harvester Co. will join Inland Steel Co. and Cleveland-Cliffs Iron Co. in the Marquette jasper project . . . Firth-Sterling Inc., Pittsburgh, will double its production of zirconium and will be able to make ingots up to 2000 lb. . . . January industrial furnace orders booked by Industrial Heating Equipment Association members rang in at $10.2 million, up 106 per cent over January of last year . . . GM announces downward adjustment of 1 cent an hour in the cost-of-living allowance paid to hourly workers . . . U. S. Chamber of Commerce calls unemployment compensation payments to Westinghouse strikers in Pennsylvania a "dangerous precedent."

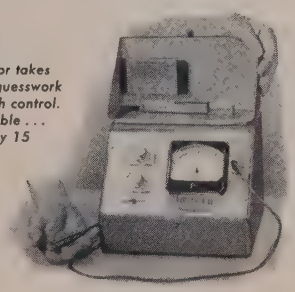
When does surface smoothness begin to waste your money?

In most plants today when a design engineer specifies a certain finish for a part, no one in production knows whether the part will be overmachined, O. K., or too rough until that part reaches the inspection department.

By then it is too late.

The costly consequence is that the company loses money on every part finished too well, AND on every reject resulting from underfinishing. Surface finish begins to waste your money at two precise points . . . *the moment you finish a part a single microinch better than the job requires, and the moment you finish a part a single microinch worse than required.*

Surprising as it may seem, most in-process checking today consists of judging how the finish *looks* and how it *feels* because no accurate, portable, in-process checking equipment has been available. The production department had no tool that could instantly tell the machine operator when he had met the specification.



The Brush Surfindicator takes the costly guesswork out of finish control. Fully portable . . . weighs only 15 pounds.

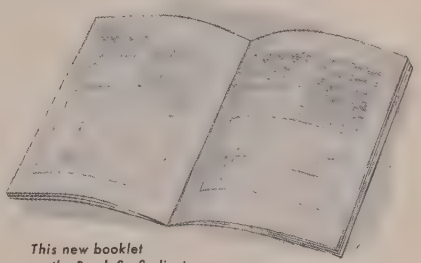
What has been done?

Brush has developed an amazingly rugged electronic surface measuring device called the SURFINDICATOR* which can be carried anywhere in the shop to obtain an instantaneous, accurate in-process measurement of roughness on any surface – flat, round or inside-a-hole.

Now you can set up optimum specifications for surface finish based on your laboratory or pilot model tests . . . and then hand a reliable instrument to the production department to help them meet those specifications with no waste of worker or machine time. You can mount SURFINDICATORS at each machine or set up checking stations throughout the plant. And your regular machine operators can use them . . . it doesn't take an expert.

How It Works

All the user does is pass the stylus over the surface in question and take a direct reading. It's simple, fast, accurate and above all it's practical . . . for metallic surfaces and for glass, porcelain, plastic, paper and other materials.



This new booklet on the Brush Surfindicator includes the new ASA standards . . . will help you establish economical surface finish control.

You should know all about this portable device, its many, many uses and the savings it can mean to your company. We tell the whole story in a new booklet which also includes the new ASA standards on surface finish for industrial use. Write for your copy today on your company letterhead. *T.M.

BRUSH ELECTRONICS COMPANY

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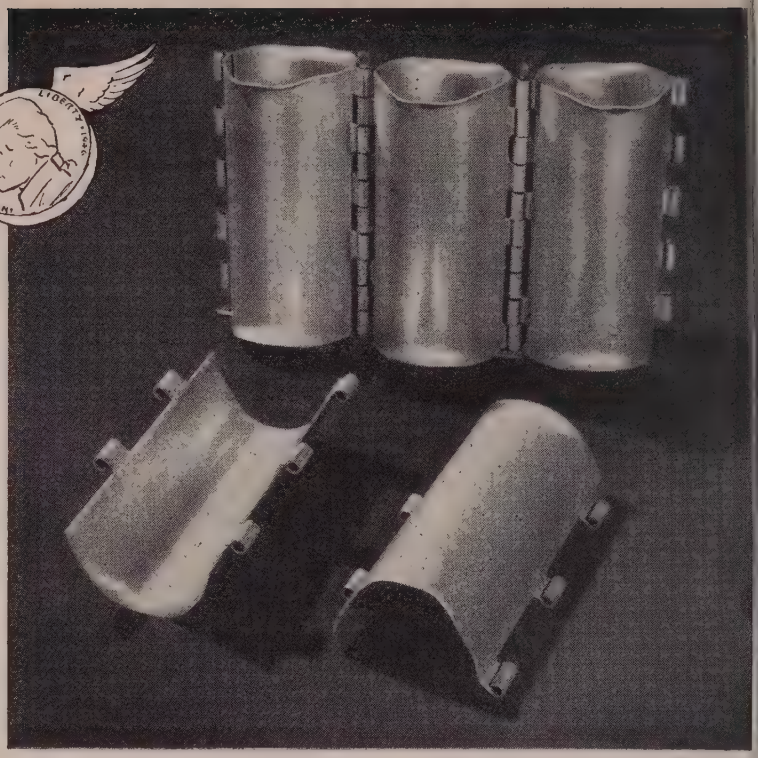
BRUSH ELECTRONICS



How Armco ALUMINIZED STEEL Helped Solve The Case of The Missing Nickels

Nickels were "disappearing" from soft drink vending machines. At least that's what the operators thought. However, investigation revealed that the machines' non-ferrous chain conveyor links were stretching so much customers could get two bottles for only one nickel.

Armco ALUMINIZED STEEL was called into the case and solved it. The manufacturer was able to make a strong, non-stretching link with the needed corrosion resistance.

This 2-in-1 metal, sheet steel coated in molten aluminum, offers an unusual combination of properties that may help you solve some of your problems and cut costs too.

Reflects Heat . . . Resists Heat

ALUMINIZED STEEL has the strength of steel plus the surface properties of aluminum. It also gives high heat reflectivity and heat resistance. Up to 1250 F the coating on Type 1 ALUMINIZED STEEL remains intact.

Type 2 ALUMINIZED STEEL has excellent resistance to atmospheric corrosion. Tests show the coating lasts 3 times as long as the coating on standard galvanized steel sheets.

And savings, compared to using aluminum on an equal strength basis, can be as high as 40 to 50% of material cost.

For complete information on how you can use Armco ALUMINIZED STEEL to cut production costs and give your products added sales appeal, just fill in and mail the coupon.

ARMCO STEEL CORPORATION
1006 Curtis Street, Middletown, Ohio

Send me information on Armco ALUMINIZED STEEL
We manufacture_____

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Firm_____

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City_____ Zone_____ State_____

ARMCO STEEL CORPORATION
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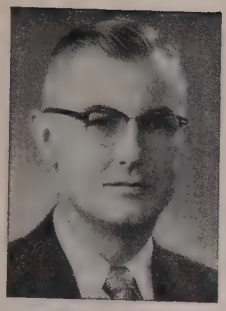


Industry's SUB for GAW

Economist Peter Drucker says the greatest single accomplishment of the American industrial system has been to elevate the American worker to the middle class.

Frequent and substantial wage increases, pensions, social insurance and many other benefits granted by industry since World War II have gone far in this direction. While they have added heavily to the cost of doing business and generally have been viewed with considerable apprehension by management, metalworking has taken them in stride. In the process, it has contributed to rising living standards, has enjoyed prolonged prosperity and now is on the threshold of its greatest expansion.

During coming labor negotiations, metalworking management will face up to a new issue designed to make the worker even more middle class: Supplementary Unemployment Benefits. Management will be well advised to make careful and objective study of the issue—its costs, its dangers and its possible benefits.

While the demand will be pressed by the unions, it should be remembered that SUB is a management invention—not a union gimmick. While the big unions were beating the drums for a guaranteed annual wage, which most management people thought impractical, industry was pondering an alternate plan. It emerged as SUB. The first major program was outlined by Ford Motor Co. Other plans, with important variations, were proposed by the glass industry, by the can companies, the Euclid Division of General Motors and others.

Ford recognizes the benefits as well as dangers of SUB. Says Vice President John Bugas: "We believe our plan serves the best interests of the company and employee alike . . . It has limited liability . . . It has predictable maximum costs . . . Its economic effect is contracyclical . . . It affects our business dealings just about like any other 5-cent labor cost increase.

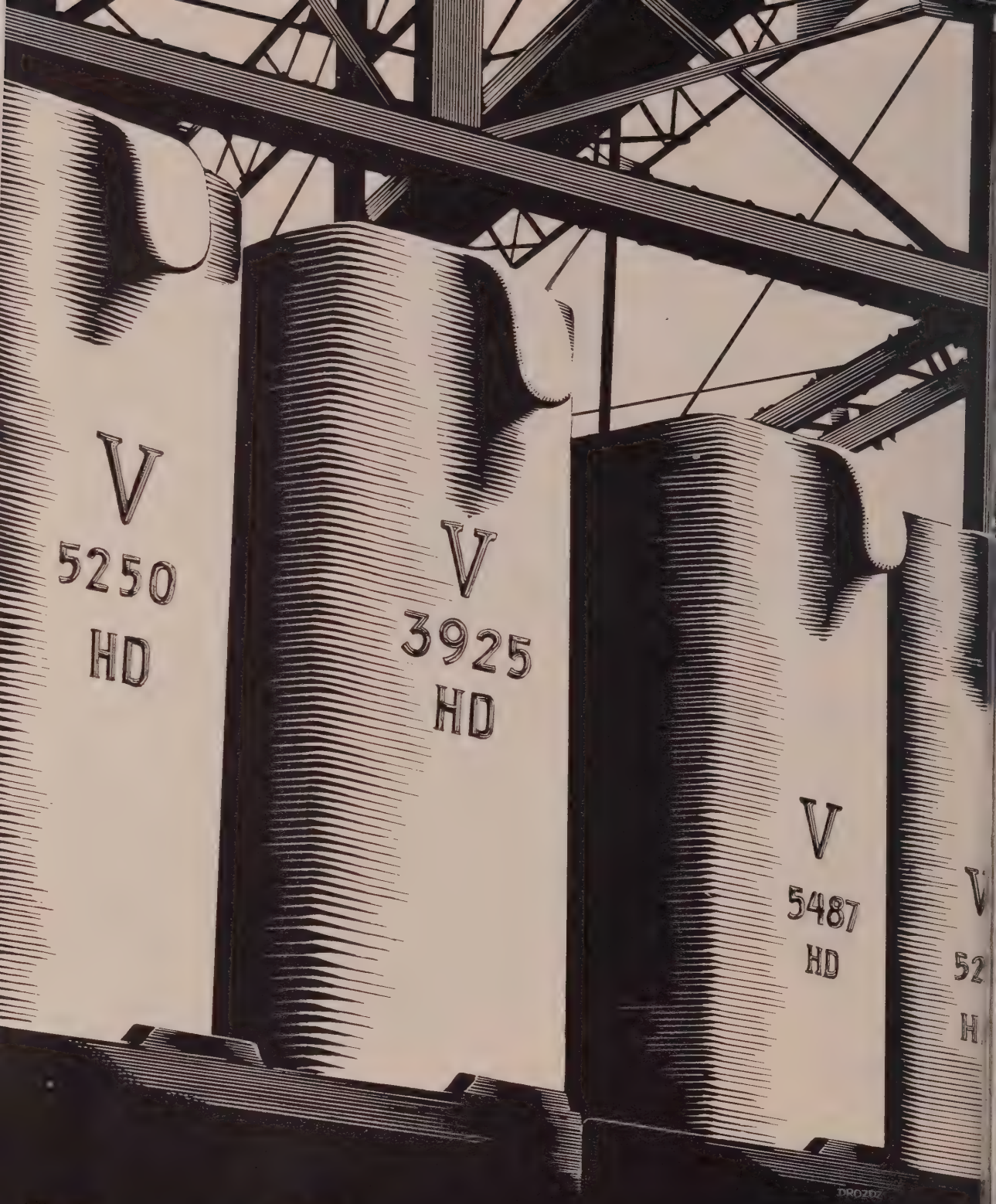
"We are for the plan because we believe it will enhance materially the actual and psychological security of our employees. It will help to buttress the optimistic outlook which means so much for our future progress and prosperity."

Mr. Bugas believes management should approach the issue with a positive creative attitude. It will help you recognize and avoid these critical pitfalls: The encouragement of idleness by allowing too narrow a gap between pay for working and allowances for layoffs; plans that permit costs without limit; and programs that require the older and more skilled worker to ante up for the benefit of marginal employees.

Preparation and study will enable you to minimize the dangers and costs of SUB and maximize its benefits.

Walter J. Campbell

EDITOR



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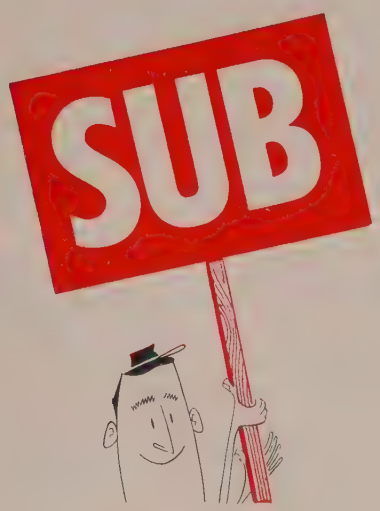

Get Set for SUB

Your union may not ask for Supplemental Unemployment Benefits this year, but chances are it will eventually. Here are tips on how to cope with the demand

YOU DON'T know if 1956 will be your year to ride the SUB tiger. But you should be studying the major contracts already signed to prepare for the demand, if and when it crosses your bargaining table.

The Chances—As one industrial relations executive put it: "Let's face it—SUB in some form is here to stay." What are your chances of having to meet the demand this year? Two factors weigh heavily:

1. What's the status of your pension, hospitalization and insurance programs? Many companies, particularly those in the under-500-employee group, haven't caught up with industry leaders on fringe benefits. Associated Industries of Cleveland reports that many of its members are being pressed for them in current bargaining.

2. Equally important is: Which union do you have to bargain with? If it's the autoworkers, chances are the SUB demand will be made. Since the Ford and GM pacts, Walter Reuther has remained inflexible on the SUB demand, especially in plants he considers "key targets" to strengthen his SUB pattern.

Before June—But several unions like the machinists and some smaller independents are not interested in SUB, particularly the Ford-type plan. They're more interested in wage boosts. The steelworkers are expected to seek a "vested" or income security type SUB program in "big steel" (see STEEL, Feb. 20, p. 65). But chances are good that if your contract talks come before June, your steelworkers group will not demand SUB.

Labor contracts vary from company to company—patterns of employment, production, layoffs and wages differ widely. That's why even though a few major SUB contracts have been signed, you don't necessarily have to follow them to the letter in your bargaining.

Refinements — "Sure, last year the SUB precedent was set," says one Chicago-area metalworker. "But 1956 will see the refinements developed. Certainly, the steelworkers' McDonald is going to seek a better plan than Reuther got for the autoworkers. And we in our company are going to press for a plan that'll better fit our needs."

The table (page 52) shows the highlights of the major SUB contracts in effect. Note the similarities: Cost to employers, amount of benefits paid. Major differences: Duration of payments, seniority and eligibility requirements, provisions for dependents, restrictions on benefit payments, individual account vesting.

Next Year—One labor negotiator in the Milwaukee area reports: "We've completed four or five USW contracts without SUB. They took 6 to 10 cents in a wage boost and are willing to wait until next year to follow any 'big steel' plan which may come this summer."

Metalworking contract settlements since October, incidentally, have ranged from 6 to 12 cents in direct wage boosts, plus expansion in pension, hospitalization and insurance programs. Noteworthy too: More two and three-year contracts among smaller firms.

Considerations—Primary considerations in studying a possible SUB plan for your company are contribution costs and your layoff record. For many companies the contributions could substantially reduce working capital. Severe employment cycles could deplete the SUB fund so rapidly that a 5-cent contribution would be inadequate.

While most of the major contracts involve a 5-cent-per-hour-per-employee contribution until a maximum fund limit is reached, several settlements have been made for less. Continental Can Co., for example, pays only 3 cents into its general fund, although the company has a contingent liability for 2 cents more if the fund becomes exhausted.

The Albion Plan—Albion Malleable Iron Co., Albion, Mich., makes contributions on the basis of the amount of money in the fund. Payment began at 1.9 per cent of the total payroll. Each four months a new compilation of the trust fund is made. As the fund amount increases toward the maximum, contributions decrease. At its maximum, the fund amounts to about $165 per employee, compared with nearly $400 in the Ford plan.

To permit this lower cost con-

Features of the Major SUB Plans

	FORD — GM	CAN COMPANIES
Benefit Duration	26 weeks	52 weeks
Weekly Maximum Benefit	$25 plus state U. C.	$25 plus state U. C.
Benefit if no state UI because of:		
1. Lack of qualifying wages	None	Up to schedule
2. Duration exhausted	Regular 60% take home pay	$46.80 plus dependent's allowances
Take home pay equivalent	65% 1st 4 weeks 60% next 22 weeks	65% for 52 weeks
Eligibility	One year	Three years
Alternate method of drawing	None	None
Company Contribution	5c per hour	5c per hour—American 3c per hour—plus 2c contingent-Continental
Maximum funding per worker	$400	——

tribution—designed to conserve the company's working capital—Albion Malleable pays the first four weeks of SUB benefits to employees from its own funds as current expense. Payments for the additional 22 weeks come from the SUB trust fund. Also part of Albion Malleable's plan: Family status provisions similar to those of Michigan's unemployment benefits.

Layoff Patterns — In studying your layoff patterns to determine what your maximum SUB fund should be, go back at least ten years. Most plans provide for a one-third layoff as the maximum fund protection. Important too: Can you do anything to stabilize operations and reduce layoffs?

The Can Plan—With its contingent liability feature, Continental Can has a real incentive to stabilize employment. In one of its plants it found that before 1955 employment fluctuated between 190 and 370 workers. That year it concentrated on reducing the seasonal variations by using more warehousing, transferring employees from department to department, making advanced sales estimates and using the figures to plan production emphasis to level off operations. Results: In 1955 employment fluctuated between 200 and 286 workers.

Additional factors to consider in evaluating your layoff experience: How many layoffs were due to general business conditions rather than seasonal influences? To supplier strikes? Re-tooling and model changes? Transportation problems? Weather? What proportion of workers laid off were not rehired?

State Benefits—Other points relating to the size and drain on the SUB fund are eligibility and the amount of your state unemployment compensation. The can companies require three years of service for eligibility, largely because of seasonal employment factors. Ford, GM, Allis-Chalmers and most metalworkers require a year of service.

Check on your state's unemployment compensation figures. You'll be paying the difference between those and 65 per cent of take-home pay—the higher the state payment, the lower your SUB benefit.

SUB is nothing more than a new cost of operation. The contribution cost will not decrease under current contracts expiring in 1958 because the maximum fund level will not be reached by then. Theoretically, the eventual cost of SUB will decrease substantially for the company that maintains stabilized employment. That's why it's important that you develop as accurate a picture as possible on what your specific SUB needs may be.

More Interest—Many executives feel that Mr. Reuther will not settle for the Ford program as it is—with its eventual decreasing costs. They see the CIO pushing for expansion of benefits which will not only maintain the present 5-cent contribution but increase it. That's one reason there's more interest today in the vested or income security type SUB plan, such as the glass plan or that of GM's Euclid Division.

STEEL will analyze the pros and cons of the two systems in its Mar. 19 issue.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

Income Security Plans (Vested)

ALLIS-CHALMERS	EUCLID DIVISION	GLASS PLAN
26 weeks	As long as unemployed or until personal account exhausted	20 to 40 weeks
$25 plus state U. C.	2/3 basic weekly rate with state U. C.	$15 to $30, not over 10% in personal account
Up to 65% take home pay Full 65% take home pay	½ basic weekly rate when Not entitled to U. C.	Not tied to state U. C. in any way — can draw for unemployment or sickness
65% for 26 weeks	——	——
One year	Seniority after Aug. 1, 1955	One Year
May draw SUB in lump sum when U. C. exhausted	Final settlement on individual account on death, termination	Final settlement on individual account on death, termination
5c per hour	5c per hour	5c per hour
$312	None	$600, excess goes to vacation pay

C F & I Stabilizes Output

HOW DO YOU keep men and equipment busy? Even in good times, the question continues to plague the steel industry. Finding an answer becomes more urgent as costs rise with each new labor contract.

A. F. Franz, president, Colorado Fuel & Iron Corp., Denver, is attacking the problem with a program designed to keep facilities producing the year around. At CF&I's Pueblo, Colo., plant, where a new open hearth will boost capacity to 1,685,000 tons by July, several plans are taking shape.

Pueblo—The rod mill now makes wire rods for processing into wire and wire products. By adding run-out tables and a pair of 320-ft cooling beds, it will also be able to produce plain and reinforcing bars in straight lengths from 750-lb billets. This revamping job will be completed by August. Additional equipment for making concrete reinforcing mesh has been installed to round out its wire products.

Warehouse space is being expanded to inventory products (like baling wire) subject to seasonal demand. Says Mr. Franz: "We believe it's important that we do everything possible to employ labor on a steady basis even to the extent of inventorying seasonal items. We can cut down idle plant time and create steady employment. Laying off men and then bringing them back is more costly than additional inventory.

"The men like the idea, too. I've been trying to put myself in the place of a guy that earns, say, $100 a week. If he knows he's going to get $100 a week steadily, why he's going to be a darn sight better worker than if he knows he's going to get $100 a week for 40 weeks a year."

A stretch mill is being added to the seamless pipe mill to produce 2⅜ and 2⅞-in. pipe from larger diameters.

Mr. Franz keeps the rail mill busy by using it to produce billets and tube rounds as well as rails.

Buffalo—CF&I is completing a similar program. Open-hearth capacity is being increased by 100,000 tons to 350,000 tons a year. Two new welded fabric machines are in anticipation of an expanding road program.

Palmer—On Feb. 20 the company began moving its Worcester, Mass., spring operation to Palmer, Mass., where it now has a wire and wire rope plant. Antiquated machines will be scrapped. Others will be rebuilt and moved to Palmer. There, springmaking capacity will be doubled. Among products that will supplement a line of standard industrial springs: Auto trunk and garage door springs.

President Franz figures the program will help stabilize employment as well as keep equipment busy. His method: Build a broader product base within a framework of expansion and plant modernization.

Ticklish work on the diode assembly line at Transistor Products

Transition in Transistors

THE TRANSISTOR, eight years ago just a promising offshoot of the diode industry, eventually may be wagging the dog.

The table below shows how production has been skyrocketing. The diode, too, has shown growth, but nothing like the companion product's gains. In 1948 the capital investment in transistors started at about $100,000. Last year, transistor sales hit $12.2 million; estimates Radio-Electronics-Television Manufacturers' Association, Washington. Industrymen believe that output may climb threefold this year.

By 1960, estimates put production at a minimum of 70 million units. Much of the new volume will come in replacing the vacuum tube. "Transistors," explains A. Coblenz, assistant to the president, Clevite Corp.'s Transistor Products Division, Waltham, Mass., "can perform all the functions of the vacuum tube."

Magic $1 — Manufacturers acknowledge that there are some vacuum tube jobs that may never be in danger from the transistor. "But," adds Mr. Coblenz, "within three years, transistor prices will average under $1."

Bell Laboratories Inc., New York, points to telephone carrier and control systems as major markets. It already has one rural experimental setup operating successfully. Other markets which will be opened up within the next five years include all types of communications equipment like paging and intercom systems.

Development—Signs of the big transistor breakthrough came last year, when the first volume orders were placed for portable and auto radio use. At least seven makers are in production.

Says one transistor expert: "Spit on a copper penny and put it against a blotter, and you get enough juice to work a transistor." Low power requirements are a major reason for the success of the transistor, which has been used in hearing aids since 1952. In 1954, say market men at General Electric Co.'s Syracuse plant, 75 per cent of all transistors sold went to the hearing aid market. Producers expect that by 1960, all portable and auto radios will be transistorized.

Established — Diode economics differ. They were used in the early crystal set radios until displaced by the vacuum tube, which could amplify as well as detect a signal. Then, in 1939, the silicon diode was rediscovered as the best detector of the high-frequency radar signal. Since then, diode development has been continuous.

The result: Low-power diodes

Transistor, Diode Output Jumps

	Transistors	Diodes
1956	9,000,000	17,000,000
1955	3,600,000	15,000,000
1954	1,300,000	7,000,000

Figures are industry estimates by General Electric Co.

have made an established place in TV sets, in computers and in other applications where their function is to rectify and detect. Diodes also are being built with enough current-carrying capacity for industrial use. Used in plating equipment, for example, their main function is to convert alternating to direct current. Clevite's biggest germanium power diode will handle up to 300 amps of continuous forward current.

Between 1946 and 1955, estimates are that some 75 million diodes were made. Though continued sales gains are certain, few makers look for the marked upswing expected of the transistor, since markets are more established.

Status — Most makers produce both transistors and diodes. In either, they are far from their goal of automation. Transistor orders above 50,000 units are still the exception, and assembly demands techniques more skilled than those of a watchmaker. Compared with steelmaking practice, making the germanium or silicon "heart" of the semiconductor is still on a laboratory basis. Materials must be as pure as 1 part in 100 million.

Despite the difficulties, many makers are in the second stage of mechanization, with one machine now doing the job of three or four. Westinghouse Electric Corp. is getting into production at its new plant in Youngwood, Pa. Germanium Products Corp., Jersey City, N. J., has a plant designed to turn out up to 10,000 transistors a week.

Outlook—Today, only about a dozen companies are active producers of both diodes and transistors. There may soon be more. Bell has some 60 licensees. Development work on both the product and its uses continues. Clevite lists some 150 different applications. In industry, steel mill controls, rectifiers for generators and welders and ultrasensitive photoelectric cells are hot ones.

Dr. William Shockley, who pioneered transistor development for Bell, and now heads up Beckam Instrument Inc.'s new lab at Stanford, Calif., believes we may see more than a 100-fold increase in transistor output within the next five or ten years.

An electronic data processing system is a natural for . . .

Fewer Clerks: More Data

THE NUMBER of people employed in offices has jumped 150 per cent in 30 years, but there is still a shortage of clerical help.

Electronic data processing (EDP) is a natural step toward solution of this problem, over 1000 management men were told at American Management Association's conference on Electronics at Work.

How To Start — You can't just go out and buy electronic computers and data processing equipment. Alfred M. Wilson, executive vice president, Minneapolis-Honeywell Regulator Co., explains that M-H: 1. Initiated a feasibility survey. 2. Decided what types of new data were a must. 3. Looked into the problems of centralized and decentralized data processing. 4. Estimated what effect such installations would have on employees.

While these investigations eat up valuable time, Mr. Wilson points out: "Last year, while we were spending $42,000 on the feasibility survey, our analysts found elements of inefficiency and developed improvements which have produced annual savings of $56,000."

Purchase vs. Rental—Some will buy, others rent. It will depend largely on company size, financial obligations, money available, etc. One advocate of purchasing EDP equipment told STEEL: "It will be cheaper to buy . . . the equipment will not be antiquated too quickly." Reason: All electronic data processing systems are unitized. While one unit may have to be replaced from time to time, it will take many years to obsolete the entire installation.

New Jobs — Conference speakers reported that there will be a host of new jobs in the areas of preparing data, interpreting results and taking action based on information obtained. This will call for extensive training programs in advance of installations. Crux: White collar workers will have to shoulder added responsibility, be more highly trained. Production workers will receive the benefits of inventory studies, production and sales analyses, which will help to level the peaks and valleys of the production cycle.

Commercial Controls Corp. shows electronic data processing machine

Russia Strives To Catch Up

American experts find Soviet engineering good in automated bearing plant, but production techniques lag in auto and tractor plants

WITHIN 15 years Russian production facilities may be superior to ours. That warning was sounded by Nevin L. Bean of Ford Motor Co. before the Detroit chapter of the National Society of Professional Engineers.

Mr. Bean says the interest in automation appears to be greater in Russia than in the U. S. Russians no longer build manual production machines if automated lines can be made. And they expect to use computers in automation.

Mr. Bean, Dr. Weldon Brandt, Westinghouse Electric Corp., and Dr. A. C. Hall, Bendix Aviation Corp., visited Russia in December. They were the first engineers to see Russian industrial processes since World War II. Russian engineers visited this country last fall.

Russia's Progress — Mr. Bean says: "If plans we saw are carried out, Russian factories will have the machinery and techniques to make giant production strides within the next five years. Within ten years many of their production facilities will be comparable to ours, and within 15 years their production facilities and techniques may be superior to ours unless a new emphasis is placed on automated production designing in this country."

Autos—At Gorki, the engineers visited a plant that makes 1000 vehicles a day—120 passenger cars, 100 Gaz 69s (similar to the jeep) and 780 trucks.

The plant has 45,000 workers and an area of about 10.8 million sq ft. Electrical equipment for the cars is made elsewhere, as are tires, art leather, textiles and batteries. Dr. Brandt says the practice seems to be similar to U. S. as far as the division of parts made by automotive companies and those purchased outside is concerned. About 15 per cent of the value of the cars represents purchased equipment.

A new car, the Volga, has been designed to replace the Pobyetta, in production since 1946. The 4-cylinder Volga can go 80 mph. It has 70 hp and a compression ratio of 6:6. It uses 70-octane gas. And it has an automatic transmission. The Russians use 12-volt electrical systems and sealed beam lights.

Automation—Mr. Bean says the most completely automated facility he saw was the Kaganovitch ball bearing plant, the top bearing producer in the Soviet Union. It makes about 60 million bearings a year. About 1300 types range from 150-gram production bearings to 4-ton specials.

One production line is completely automated, including the handling between processes. Hot rolled forgings are dumped into hoppers at the start of manufacture. Then the parts go to automatic chuckers, through heat treating, grinding, inspection, assembly and testing and on to a packaging machine where the bearings are wrapped in oil paper and sealed in individual cardboard packages. Soviet plans call for about 30 automated bearing lines by 1960.

Another bearing line uses standard machines with automatic handling between operations.

Red progress in machine tools is reported in Feb. 20 issue of STEEL, page 125.

Summing Up—The *London Times* says in basic industry and engineering the Soviet Union is ahead of western Europe. Now Russia aspires to catch up with the U. S. However, the Communists have quite a way to go. Mr. Bean says: "On the whole, the Russian plants we saw are not as productive as those in this country. They are not as well organized, not as clean and not as well lighted. Most materials handling systems are obsolete. Much of the machinery is old, but most of it is in good condition and used to good advantage. However, we found that many of these adverse conditions are in the process of being changed."

Industrial workers can make 800 to 900 rubles a month; engineers earn up to 2500 rubles a month, but the Russian car costs 20,000 rubles

AISE Meets in Los Angeles

Ingot production capacity of 11 western states has more than tripled since 1940 while population has doubled, W. J. McClung, vice president, Bethlehem Pacific Coast Steel Corp., recently told the Association of Iron & Steel Engineers in Los Angeles.

Mr. McClung said ingot capacity in 1940 was 2,165,720 tons, compared with today's 7,131,470 tons.

Over 400 attended the annual regional meeting of the association, which included a symposium on continuous annealing of strip steel.

U. S. Steel's drum plant means more customer service as . . .

Steel Containers Roll

MORE STEEL drums will roll off production lines this year as producers expand to meet increased demand.

New Highs — Sales of heavy drums totaled 24.8 million in 1955, highest mark since the Korean War year of 1951, reports the Steel Shipping Container Institute Inc., New York. Lighter drum sales topped 8.7 million last year. A record, this exceeded 1954 sales by almost 1 million.

Pail shipments also set a new mark at 74.9 million, compared with 67.1 million in 1954.

Outlook in 1956 is for shipments of about 24.5 million heavy drums, 9.5 million light drums and 80 million pails. A spokesman for Rheem Mfg. Co., New York, estimates its sales of steel containers will increase "by a minimum of 5 per cent in 1956," with the chemical and petroleum industries leading the way.

Problem Solving — Encouraging sales figures demonstrate that this industry is overcoming some old handicaps. Shipments to the leading user, petroleum, declined from 1951 to 1954 as that industry used more pipeline facilities. Reconditioners of old drums cut into sales of new drums. Shipment from midwestern plants to eastern and southern oil and chemical firms was time-consuming.

Aggressive salesmanship helped to solve these problems. Rheem increased sales by making its product more attractive—decorating drums in as many as six colors. Inland Steel Container Co., Chicago, reports strong sales of drums with special protective linings to the chemical industry.

Best Customers—Last year that industry purchased 37 per cent of all heavy drums and petroleum producers took 42 per cent. Food, paint and armed services each bought 2 to 6 per cent.

Leading pail customers last year were paint with 27 per cent of shipments, and petroleum with 23 per cent. Other buyers include chemical producers and shippers of adhesives, glue, cement and ceramics.

Reconditioners Lose—There's a trend toward printing advertising messages on the drum. This boosts demand for new drums at the expense of reconditioned drums.

Inland Steel Container's Cleveland plant reports sales of these drums and pails have tripled over the course of the last five years. Inland has over 100 customers who use advertising messages.

Jones & Laughlin Steel Corp.'s new Port Arthur, Tex., plant includes a unit for giving drums a protective surface to increase durability of paint or lacquer and to prevent rust.

Several other drum manufacturers are expanding for better service to customers. Calig Steel Drum Co., Pittsburgh, is now completing an expansion program to round out its product line. J&L's Port Arthur plant was the third opened by its container division in two years.

Quicker Service — Problem of speeding shipments to users has been met by such new plants as that of U. S. Steel Corp.'s Products Division in Camden, N. J. Officials expect to produce 2.3 million drums and 3.2 million pails annually in this plant, opened in 1955. They'll go to petroleum, paint, chemical and food industries with major installations in the East. With chemical and petroleum expansion plans set for eastern locations, you may see more eastward moves by drum producers.

Many motives, many plans come to the fore as . . .

Corporate Taxes Eyed

TAX RELIEF for small business and the graduated corporate income tax are getting a working over in Congress. Much of the current talk is thought to be political haymaking, but there's a possibility of something happening.

Sen. J. William Fulbright (Dem., Ark.), for example, has served notice he will try to amend the forthcoming bill to extend present rates of corporate income tax and excises. (That bill must be passed by Mar. 31 and is considered a shoo-in in view of federal money needs and the political climate—unless complications develop.)

Turnaround—Senator Fulbright's proposal would, in effect, reverse the current corporate tax setup: The "normal" tax rate would be reduced from 30 per cent to 22. The surtax on net income over $25,000 would be upped from 22 per cent to 30.

But under that setup, the government would lose $300 million to $400 million; so the senator has in reserve a second proposal to boost the surtax to 31 per cent—and that would gain the government $20 million, he says.

Progression—In the House, Rep. Wright Patman (Dem., Tex.) also would reduce the "normal" tax rate from 30 per cent to 22. But he proposes a graduated surtax. It would start when corporate net income hit $100,000. When corporate income increased tenfold, the surtax rate would go up 10 percentage points. The maximum marginal rate (normal, plus surtax) would be 75 per cent and would apply to income over $1 billion.

Proponents of bills to change corporate income tax rates give as major reasons: 1. To protect and encourage small businesses. 2. To allow them to retain more money for expansion, research and better management. 3. To encourage investment in small firms, and to make it easier for them to raise money in other ways. 4. To check the merger movement. 5. To possibly encourage the breaking up of "supergiant" corporations.

Nays—Opponents say: 1. A progressive income tax would take away from small firms the incentive to expand, from the larger ones, the ability to expand. 2. It wouldn't make small businesses more attractive for investment capital because of the risk involved in a small firm vs. the security of a larger one. 3. Once progressive tax rates get a foot on the stairs, they'll keep climbing until rates are even worse than they are.

Representative Patman himself points out a possible difficulty in administering a graduated income setup: "If experience with the progressive tax rates shows there is developing a tendency to create subsidiary corporations (which are permitted to file separate tax returns) as a means of evading the impact of the progressive rates, then it may become necessary to amend the law further to prevent such evasion—by requiring consolidated returns, by decreasing the amount of exemption on intercorporate dividends or by other means."

Action—The possibility of action on any of the proposals this year is regarded as slim. Some certain opposition and the fact that congressmen will want to get away early from Washington to start campaigning will work against it. But wait until next year; they'll be back for serious consideration.

Here and There

• The Natural Gas Bill is dead for this year. Any attempt to override the President's veto would have to originate in the House because it passed the bill first. Since passage there was by only six votes and a two-thirds majority is needed to override the veto, any such attempt is looked on as foredoomed.

• A Senate Armed Services subcommittee will undertake an investigation of the Air Force's guided missile program, which Committee Chairman Richard B. Russell (Dem., Ga.) regards as inadequate. Senator Russell also has said he will try to get a $1.5 billion increase in the budget.

• Defense department wants Congress to authorize 275 positions in the $10,000-to-$15,000 bracket for scientists, plus 50 upper level scientific and professional positions in the National Security Agency. Lack of higher grade positions is hampering budget management, research and management development programs, says Deputy Defense Secretary Reuben B. Robertson.

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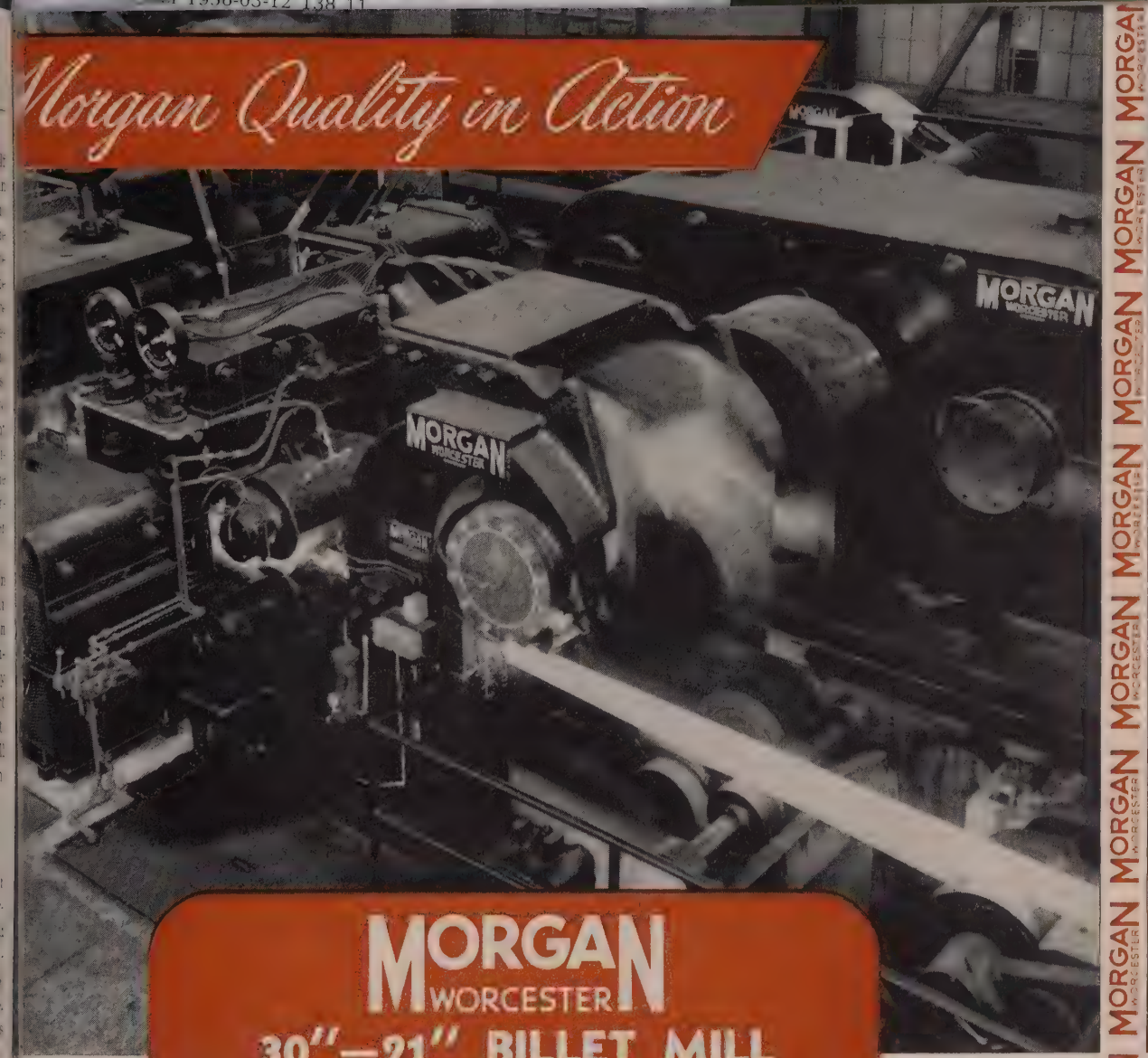
Morgan Quality in Action



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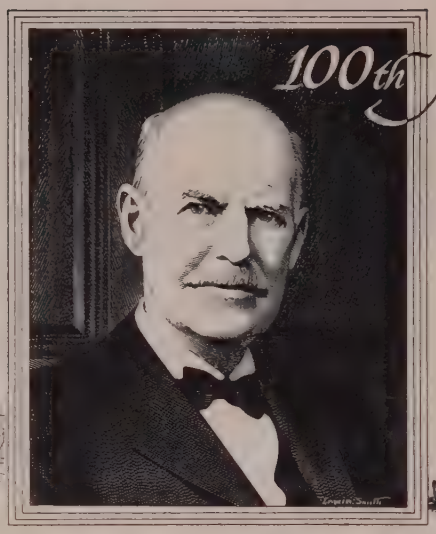

100th Anniversary

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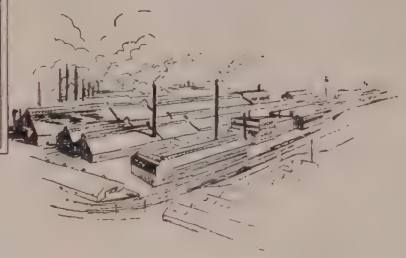
SCIENTIST
INDUSTRIALIST



this was genius . . .

EDWARD GOODRICH ACHESON

Yes, this was genius.

Thomas A. Edison knew it. In paying tribute upon the occasion of Doctor Acheson's passing, he said "... as a former associate I know the world loses a great genius."

Leo Hendrik Baekeland knew it. He remembered him "as a man who combined a most fertile brain with great strength of conviction."

Walter B. Pitkin knew it. This famous psychologist said "As he created his place in our civilization so does that place pass with him. None shall fill it."

And the press knew it. They used in their editorials such phrases as "world's acclaim of a genius," "one of the geniuses of his time," and "the loss of an inventive genius."

But what makes genius?

Employing a mixture of carbon, sand, salt, and sawdust in a simple but effective electric furnace, made up of a few strands of wire, a carbon rod, and a plumber's bowl, Edward Goodrich Acheson was able to bring into being a mass of scintillating crystals rivaling many gems in splendor and almost matching the diamond in hardness. These highly abrasive crystals he crushed and made into grinding wheels, and these wheels, in turn, were used to shape metals and make machines. Called "Carborundum" by Acheson and silicon carbide by the chemist, this new material did its job so well that it is credited with making possible today the mass production of automobiles, tractors, and countless other mechanisms.

Possibly silicon carbide could be made better—harder or sharper. To this end Acheson subjected silicon carbide to higher temperatures for longer periods; what he obtained was not a harder substance but, instead, one of the softest—pure graphite. The extreme conditions to which he had exposed his jewels of industry brought about their disintegration, the silicon passing off as vapor and the carbon remaining as a soft, unctuous residue. Manufactured graphite, destined to be of far-reaching importance, became another of Acheson's contributions to industry.

Unquenchable curiosity, coupled with the indomitable spirit that was his, led him to uncover means of preparing this new product of the electric furnace in the form of plates and cylinders. Put to work as electrodes, these soon revolutionized electrochemical and electrometallurgical operations. Acheson had now made commercially feasible the production of new families of chemicals and laid the groundwork for the present efficient manufacture of steel and alloys.

During Acheson's painstaking efforts to produce graphite crucibles he experimented with many clays for use as binding agents—and he learned much about them—so much in fact that he was able to explain why the ancient Egyptians used straw in their brick making and what caused the formation of the deltas of the Nile and Mississippi. Most important, he discovered a method of rendering graphite colloidal.

Colloidal graphite in modern industry plays a role that is varied and complex, its unique properties finding utility in such dissimilar fields as lubrication, electronics, metalworking, and lithography, to name a few. The techniques originated by Acheson for colloidally dispersing graphite are being applied to other solids including carbon blacks, pigments, and minerals.

To those of us in the companies identified with Doctor Acheson, his perseverance and achievement are an inspiration. We are proud to offer this tribute to his genius on the 100th anniversary of his birth.

Acheson Industries, Inc.

ACHESON COLLOIDS COMPANY
PORT HURON, MICH.

ACHESON DISPERSED PIGMENTS CO.
PHILADELPHIA, PA.

GREDAG, INC.
NIAGARA FALLS, N. Y.

ACHESON COLLOIDS LIMITED
LONDON, ENGLAND

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Ford's Walker: Quick Change Artist

"CHANGES are our business," says George W. Walker, vice president and director of styling, Ford Motor Co., Detroit.

"An industrial stylist has to design a product so pleasing that millions of hands will want to reach out and buy it," he asserts. Mr. Walker knows what he's talking about. He's rated as one of the top men in a design conscious industry.

3000 Products—Before joining Ford in May, 1955, he acted as design consultant on Ford, Lincoln and Mercury automobiles nine years. He also had his own industrial design firm in Detroit. Over the last 25 years Mr. Walker and his associates styled more than 3000 products ranging from cars to kitchen clocks.

He admits that his biggest thrill was designing the 1949 Ford in three months—after everyone else said it couldn't be done.

Medic—"Stylists are doctors of industry," Mr. Walker claims. "When sales are sick, they come in and pep 'em up!" This calls for an astute knowledge of what the buying public wants. He feels this is particularly true of the automobile business where cars are designed two or three years ahead of production schedules.

In an era when stylists are holding most of the trump cards in autobuilding circles, Mr. Walker points out: "People instinctively recognize good styling, but they have to be led up to the point where they will accept it. They can't be pushed."

With Pencil—A man who draws as he talks, Mr. Walker punctuates his remarks with sketches. He says: "Styling is the most important factor that people can control today. Their automobile symbolizes a perfect way of life. They want it sleek, sophisticated and comfortable. It's up to the stylists to interpret their wants and put them on the drawing board."

Mr. Walker has been doing just that since he first worked as an illustrator on the Cleveland-built Peerless car. Born in Chicago, May 22, 1896, he moved to Cleveland and studied art at the Cleveland School of Art; later at Otis Art Institute, Los Angeles.

His nonstyling career includes a tour of pro football. He played quarter and halfback for the old Los Angeles Wingfeet and for the former Cleveland Panthers.

Mr. Walker is married and has two children. During World War II, he served as a special design consultant for the Army Ordnance Dept.

Where Steel Ingot Capacities Are Being Increased

Company	Place of Expansion	Ingot Expansion (Net tons)	Type of Steelmaking Facilities	Completion Date
U. S. Steel Corp.	Chicago	1,500,000		
	Geneva, Utah	380,000	Enlarge 10 open hearths	
	Other plants	620,000		
Total		2,500,000		By end of 1958
Bethlehem Steel Co.	Bethlehem, Pa.	500,000		
	Lackawanna, N. Y.	500,000		
	Sparrows Point, Md.	2,000,000	Rebuild open hearths and add 7 open hearths	
Total		3,000,000		By August, 1957
Republic Steel Corp.	Chicago	372,000	Improve 3 electric furnaces	
	Cleveland	792,000	Enlarge open hearths and add 2 open hearths	
	Gadsden, Ala.	204,000	1 or 2 new electric furnaces	
	Warren, O.	408,000	2 new electric furnaces	
	Youngstown	Being studied		
Total		1,776,000		By mid-1957
Jones & Laughlin Steel Corp.	Aliquippa, Pa.	300,000	2 oxygen converters	
	Cleveland	400,000	Improve open hearths and add 2 electric furnaces	
Total		700,000		1957
National Steel Corp.				
Great Lakes Steel Corp.	Detroit	650,000		
Weirton Steel Co.	Weirton, W. Va.	350,000	Includes addition of 1 open hearth	Mid-1959
Total		1,000,000		
Inland Steel Co.	Indiana Harbor, Ind.	800,000	Add 3 open hearths	By 1959
Armco Steel Corp.				
	Middletown, O.	630,000	Add 3 open hearths	
	Sheffield Steel Div.	420,000		
Total		1,050,000		By January, 1958

Steel Expansion Goes Ahead

STEEL INDUSTRY expansion is moving along at a 4-million-ton-a-year average. That's the pace predicted by Bethlehem Steel Co.'s president, Arthur B. Homer, last May (see STEEL, Sept. 5, 1955, p. 41).

Projects which steel producers have announced, or are willing to reveal, total 14.2 million net tons (see table above). Most of them will be completed in the next three years.

In the Billions—Outlay in 1956 for new equipment and construction will set a record—$1.2 billion, the American Iron & Steel Institute says. To expand the nation's steelmaking capacity by 60 million tons (which Mr. Homer says must happen) over the next 15 years (1956 through 1970), the industry will spend $16.5 billion in addition to the 1956 outlay of $1.2 billion, STEEL estimates. Additional billions will be spent for replacement of present capacity. Steelmaking facilities last about 25 years.

Electric furnaces are making a strong numerical gain. Of the new steelmaking furnaces already decided upon, ten are electric arcs. That's equivalent to 4 per cent of the number of electrics in existence on Jan. 1, 1956. The 22 new open hearths already announced are equivalent to 2.4 per cent of the number of open hearths in the country on that date. Four new oxygen converters for making steel are also revealed. There are three such converters now.

Three New Stacks—Included in the iron and steel industry expansion are three new blast furnaces. One will be a 1200-ton-a-day stack at Granite City, Ill., for Granite City Steel Co.; one will be a 1000-ton-a-day furnace at North Birmingham, Ala., for United States Pipe & Foundry Co.; and the third will be at Sparrows Point, Md., for Bethlehem Steel Co.

Another Way—Expansion is not limited to furnaces. Some companies which can make more steel than they can process are expanding their finishing facilities. One company doing this is Allegheny Ludlum Steel Corp., Pittsburgh. It will spend $30 million in 1956 and 1957 to build up its finishing capacity to its basic steelmaking capacity. Another company is International Harvester Co., Chicago. It

Company	Place of Expansion	Ingot Expansion (Net tons)	Type of Steelmaking Facilities	Completion Date
Colorado Fuel & Iron Corp.	Claymont, Del.	400,500		
	Pueblo, Colo.	200,000	Add 1 open hearth	July, 1956
	Tonawanda, N. Y.	55,000	Open-hearth improvements	1956
Total		655,500		
Wheeling Steel Corp.	Steubenville, O.	270,000		1957
Sharon Steel Corp.	Farrell, Pa.	350,000	Add 3 open hearths	1956
Kaiser Steel Corp.	Fontana, Calif.	633,000*	Install 2 oxygen converters*	Early 1958
Pittsburgh Steel Co.	Monessen, Pa.	185,000	Open-hearth improvements	Mid-1957
Crucible Steel Co. of America	Midland, Pa.	72,000	Open-hearth improvements	1956
Granite City Steel Co.	Granite City, Ill.	360,000	Open-hearth improvements	By early 1958
Northwestern Steel & Wire Co.	Sterling, Ill.	250,000*	Add 1 electric furnace*	
Milton Steel Products Div. Merritt-Chapman & Scott Corp.	Milton, Pa.	25,000	Add 1 electric furnace	March, 1956
Detroit Steel Corp.	Portsmouth, O.	160,000	Add 1 open hearth	1956
Alan Wood Steel Co.	Conshohocken, Pa.	175,000	Add 1 open hearth	Mid-1956
Copperweld Steel Co.	Warren, O.	41,620	Electric furnace improvement	By end of 1956
Lone Star Steel Co.	Lone Star, Tex.	Being studied		
Laclede Steel Co.	Alton, Ill.	60,000	Enlarge 4 open hearths	July, 1957
Keystone Steel & Wire Co.	Peoria, Ill.	75,000	Enlarge 4 open hearths	Late 1957
Continental Steel Corp.	Kokomo, Ind.	27,580	Improvement of handling equipment	Late 1956
Carpenter Steel Co.	Reading, Pa.	16,000	Add 1 electric furnace	By June 1, 1956
Southern Electric Steel Co.	Birmingham	35,000	Add 1 electric furnace	1957
TOTAL		14,216,700		

*Being considered.

will complete a $10-million program this year to up its finishing capacity into line with an ingot capacity which has been expanded 00,000 tons. Then, International Harvester will use a figure of 1.2 million tons (instead of 1 million) or its ingot capacity.

It Takes Steel—The steel expansion program is adding pressure to the already heavy demand for steel. For every ton of steel ingot capacity built, 0.4 of a ton of steel is required.

Southern Mill Ready To Roll

A new steel producer—Southern Electric Steel Co.—will start rolling operations soon.

The company, located on a 25-acre site at Birmingham, has been producing ingots since Dec. 22. It has one electric arc melting furnace with an annual capacity of 0,000 net tons of steel, and is considering the addition of one with an annual capacity of 35,000 tons.

The company's products will be bar-size shapes produced on a 16-in. mill and a 12-in. mill.

The firm, a closed corporation formed last April, is headed by H. P. Bigler, president; R. W. Scholl, executive vice president; and W. M. Neal, vice president.

Mr. Bigler was executive vice president of Connors Steel Co., Birmingham, before it was acquired by H. K. Porter Company Inc., Pittsburgh, and Mr. Scholl was assistant vice president at Connors. Mr. Neal was vice president and secretary of Sloss-Sheffield Steel & Iron Co., Birmingham, before it was merged into United States Pipe & Foundry Co.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

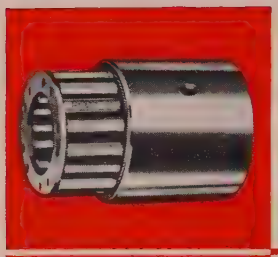
Billions for Steel Expansion

	Billions
1957-1970	$16.5*

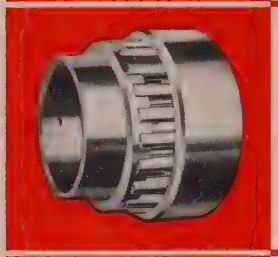
For New Equipment and Construction†

	Millions
1956‡	$1,200
1955	730
1954	680
1953	1,000
1952	1,170
1951	1,041
1950	513
1949	510
1948	583
1947	496
1946	291

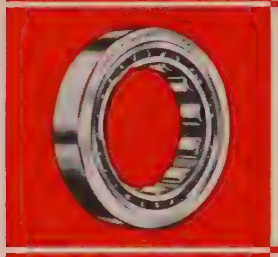
*STEEL's estimate. †Source, American Iron & Steel Institute. ‡Estimated.



TRUNNIONED ROLLER CAGE—Economical for volume use on thin-annulus bearings. End rings are hardened steel stampings, connected by riveted bars interspersed between rollers to form an integral unit. Races can be omitted if desired.



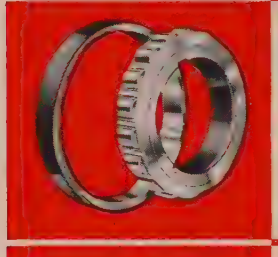
POCKETED END RING CAGE — Designed for fairly large bore bearings in heavy-duty service. Rollers are guided accurately by pockets drilled in bronze end rings. Riveted connecting bars form an integral unit, so races can be omitted if desired.



STAMPED STEEL SEPARATOR — Economical for volume use on wide range of bearings with short rollers. A single steel stamping with bars coined to conform to roller contour. Simple, open design assures large lubricant capacity and good circulation.

FORMED BAR CAGE—Well adapted for volume use on heavy-duty bearings. Hardened steel end rings are connected by cold-rolled shaped bars conforming to roller diameter. Insures quiet operation, better roller guidance, and the smooth surface of bars protects rollers.

DRILLED POCKET CAGE—Used on better-grade bearings to provide extremely close control of rollers, which operate in pockets drilled and reamed in bronze cylinder. Riveted ring on one end retains rollers permanently, so races may be omitted if desired.



SEPARABLE BROACHED POCKET CAGE—Used only on finest high-speed bearings. An integral bronze cylinder with pockets broached for maximum uniformity. Insures minimum friction, better oil circulation for cooling. Rollers can be removed for inspection.

NON-SEPARABLE BROACHED POCKET CAGE—Similar to the above and offers all the same operating advantages. Used for "blind" installations where rollers must be retained with inner or outer race. Roller drop controlled by deforming bars after rollers are placed.

What makes a cylindrical roller bearing good?

When you buy a roller bearing, you expect it to do a certain job for you. How well it does that job depends on many different factors. This series of messages is designed to help you recognize some of these important differences and get more for your bearing dollar.

The RIGHT KIND OF RETAINERS for the application

The basic parts of a roller bearing are the rollers, the races, and the *retainer* which locates and guides the rollers. There are significant differences in the design and construction of retainers, which influence bearing cost and performance. Some are simple and economical, well adapted for volume production; others are more costly but insure improved roller guidance, or cooler and smoother operation, or longer heavy-duty service. The seven basic types in current use are illustrated.

HYATT MAKES ALL SEVEN TYPES . . . EACH THE FINEST OF ITS KIND! **You will find complete details in HYATT General Catalog No. 150, or your nearby HYATT Sales Engineer will gladly help you choose the type best suited to your requirements. Remember, HYATT is America's *first* and *foremost* maker of cylindrical roller bearings. Hyatt Bearings Division of General Motors, Harrison, N. J.**

GM GENERAL MOTORS

HYATT

ROLLER BEARINGS

Component Weights of V-8s

	AMC V-8 Weights lb	Avg V-8 Weights lb
Engine Without Transmission	601	760
Cylinder Block	160.9	230
Crankshaft	62.8	70.5
Cylinder Head (each)	49.5	52
Exhaust Manifold (including crossover)	27.9	28
Intake Manifold	27.8	28
Front Cover	14.7	16
Camshaft	10.2	11.5
Connecting Rod Assembly	1.72	1.6
Piston	1.13	2
Valve Train	1.09	2.3

Source: American Motors Corp.

mallness, expandable horsepower are top attractions of . . .

American Motors' New V-8

ILOT RUNS have started on merican Motors Corp.'s V-8 en- ne. Designed by AMC, it rep- sents an expenditure of $11 mil- on and four years of research.

The engine will be featured later is spring in Nash Statesmen and udson Hornets. Both have been owered by a 6-cylinder job, or a raight-line, 8-cylinder unit at ex- a cost.

V-8s now used by American Mo- rs in its larger cars are built Studebaker-Packard Corp.'s en- ne plant in Utica, Mich. They on't be discontinued, but it's a etty safe bet that AMC would e to power more of the field with s own model. (It'll be built at its enosha, Wis., plant.)

Aims—Among the characteristics MC wanted in its engine were: ompact design, more horsepower otential (as well as adaptability future body styles), good per- rmance, fuel economy and easy rvicing.

This V-8's dimensions make it a natural for the smaller car field which AMC wants to dominate. It measures 25⅝-in. across its widest points. From the crankshaft centerline to the top of the carburetor, its height is 14 in. plus. This doesn't include the oil pan, but a good guess would put over-all height at about 23 in. It isn't too much of a difference over other V-8 heights, but unit body construction of Nash and Hudson cars permits the engine to be placed lower than in conventional models.

Length is really cut down—a few fractions over 27 in. Compare this with the Packard V-8 which is 35 in. long, and it's evident that here is a package which will make stylists sit up and take notice. Its smallness may hint that AMC is going to shrink its cars even more to provide convenient commuter designs which the growing suburbia crowd is thinking about.

Weight—It's lighter, too. Without transmission, it weighs 601-lb, compared with 765 lb for the standard Packard V-8. Pistons, the crankshaft and the cylinder block make for most of the weight savings.

Horsepower rating is 190 and doesn't sound like much by today's standards, but this V-8 is pushing a lighter car. AMC believes its future success will depend on the fact that the engine has been designed for higher ratings.

Items like crankshaft, engine block and valve sizes are set up to handle higher capacities. Connecting rods, main bearing caps and bolts are extra strong. Water and oil pumps have greater capacities than needed.

Race—Relatively minor changes (pistons, for example) are all that will be needed to boost horsepower to the 300 mark and more. Whether this is done may depend on how quickly the horsepower race proceeds and probably on how well the engine sells.

Meade F. Moore, vice president of AMC engineering and research, points out: "We traditionally have stressed the economy-performance relationship rather than high speed possibilities. We will continue to do so."

From that standpoint, engine torque (which is a better performance indicator than horsepower) shows consistently good efficiency through all speeds. For experts, the torque curve shows a differential from peak of 4 per cent in engine speeds ranging from 1500 to 3500 rpm. Maximum torque (240 ft-lb) comes at 2500 rpm. Peak horsepower (190) is at 4900 rpm.

Economy—Engineers are reluctant to say at this point just what fuel consumption will be, but they expect to get 20 to 25 miles per gallon from the Statesmen and Hornet models. Heavier cars may cut down that rate.

Well-paid mechanics and do-it-yourself car owners got more than a casual thought from the designers. Sparkplugs are set almost straight up and down well above exhaust manifolds. They can be removed easily without scorching or swearing. The generator is outside the tappet cover on the upper right-hand side of the engine,

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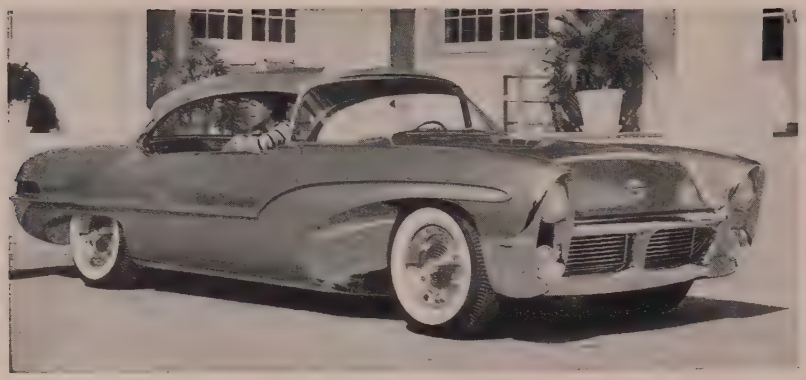

Oldsmobile's Delta to Prime the Public

This late 1955 experimental car is getting a re-run on the auto show circuit. Probable angle: To show off sweep sculptured side panels and scooped out fender areas to prime the public for potential changes on 1957 models

instead of being buried somewhere out of easy reach.

Materials—Pistons are made of an aluminum alloy and have steel inserts. Rocker arms are cast from pearlitic malleable iron, but the crankshaft is a steel forging. So far, Chevrolet is the only auto-builder with a pearlitic malleable crankshaft.

Tooling facilities for the engine are based on what AMC calls "segmented automation." Each tooling section is completely automatic, but it is not tied in with other sections. AMC feels this will lead to more flexible production because each part of the line can operate independently.

A complete rundown on AMC's V-8 will be given at the Society of Automotive Engineers' meeting, Mar. 6-8, at Detroit. John Adamson, Carl Burke and David Potter will present the paper.

Car Sales Pick Up

Sales of new cars are beginning to show signs of recovery.

"A rising demand for low priced models spurred the advance," says *Ward's Automotive Reports*. "The gap between production and sales will be narrowed down from 21 per cent in January to 8 per cent in February."

The break came during the first ten days of last month. Nash new car sales jumped 81.5 per cent over the comparable ten days of 1955. Chrysler Corp. reports sales increased to 17.4 per cent of the total market, compared with 17.1 per cent in the same period last year. Oldsmobile says its dealers delivered 13,930 new cars during the same ten days.

Ward's expects a first quarter which will be second only to 1955's same period. It says that retail deliveries for this quarter should be between 1.5 and 1.6 million. First quarter, 1955, totaled 1.8 million.

U. S. Auto Output

Passenger Only

	1956	1955
January	611,190†	659,508
February		675,769
March		794,188
April		754,007
May		724,891
June		649,372
July		659,979
August		614,392
September		461,592
October		517,669
November		748,559
December		682,698
Total		7,942,983†

Week Ended	1956	1955
Jan. 28	135,586	160,666
Feb. 4	140,582	164,265
Feb. 11	136,308	168,059
Feb. 18	128,324	173,482
Feb. 25	124,538†	171,188
Mar. 3	120,000*	167,811

Source: *Ward's Automotive Reports*
†Preliminary *Estimated by STEEL

Auto Parts Maker Expands

American Auto Parts Co., Kansas City, Mo., purchased the government's armor plate plant at Gary, Ind., for $3,260,000. American will dismantle obsolete machinery and use the site for industrial warehousing. The plant has been vacant since World War II, when it was operated by U. S. Steel Corp.

Trim Alloys Ups Capacity

Trim Alloys Inc., Boston, completed installation of its second operating extrusion press. This 750-ton unit will be used exclusively for producing interior metal moldings and trim. It was built by Fay Machine Products Inc., the engineering subsidiary of Trim Alloys. A third press, acquired in 1954 and rated at 1500 tons, is being assembled and will be put into operation when the aluminum supply improves. With the three presses operating, Trim Alloys will be able to produce more than 1.5 million lb of aluminum extrusions a month.

Exhaust Notes

Mercury division, Ford Motor Co., Detroit, is building a station wagon body plant at Wayne, Mich. Cunningham-Limp Co., Detroit, has contracted to build the 352,000-sq-ft plant which is expected to be in operation late this year. The facility will turn out station wagon bodies for all Mercury assembly points . . . Nash Motor Division, American Motors Corp., and Productora Nacional de Automotores, S. A., have signed a contract to assemble Nash and Rambler cars in Bogota, Colombia. Production should start this fall. Annual capacity: 3000 cars . . . Chevrolet says it can put 3600 lb of ice—at least its equivalent—into your car with its new air conditioning unit, which is available for either 6-cylinder or V-8 models. The package fits under the hood, and won't take up trunk or interior space. . . . Drivers expect to clock 2.3 million miles in 1956 at Ford Motor Co.'s new test site near Kingman, Ariz. The site has five-mile speed track and 16 miles of rough roads.

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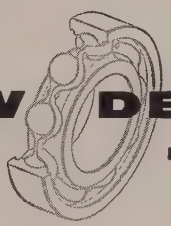
FACTS

about

NEW DEPARTURE

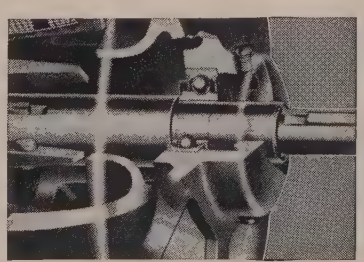
BALL BEARINGS



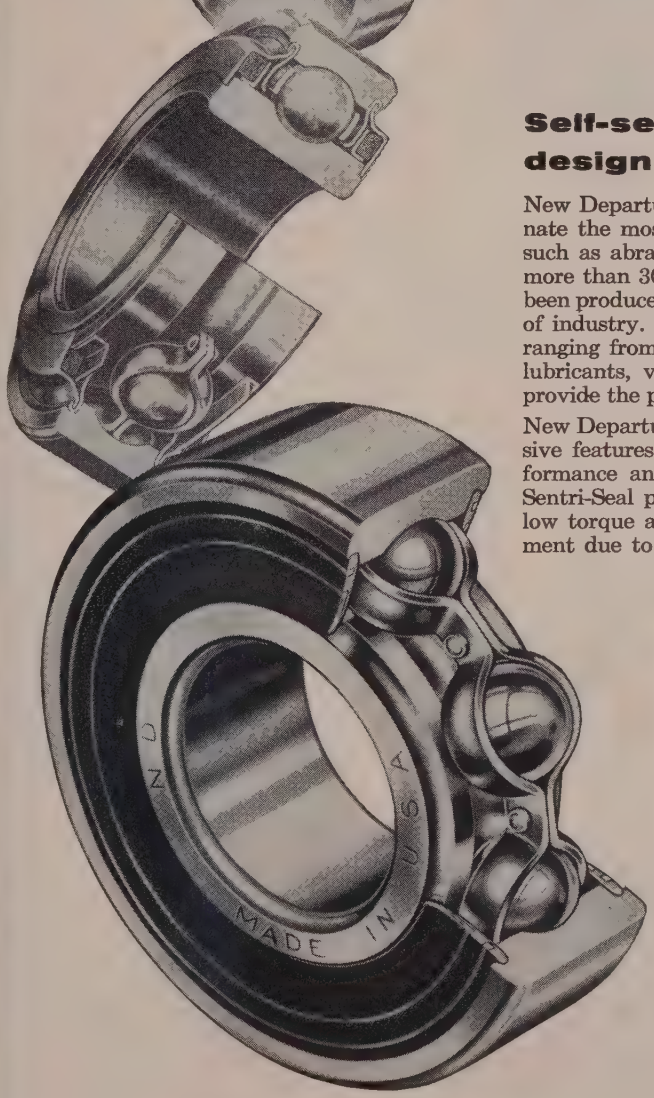
Self-sealed bearings simplify design . . . cut maintenance costs

New Departure originated self-sealed ball bearings to eliminate the most common causes of bearing wear and failure—such as abrasive dirt and improper lubrication. Since then, more than 300,000,000 New Departure sealed bearings have been produced in various types to fit the specific requirements of industry. Seals are available to keep out foreign matter, ranging from dust and dirt to corrosive gases . . . to retain lubricants, varying from heavy grease to light oil . . . to provide the protection that assures longest life.

New Departure's latest advance, Sentri-Seal, embodies exclusive features which importantly improve both bearing performance and range of application. Because of its design, Sentri-Seal provides controlled, highly efficient sealing with low torque and is not materially influenced by axial movement due to bearing end play within prescribed tolerances.



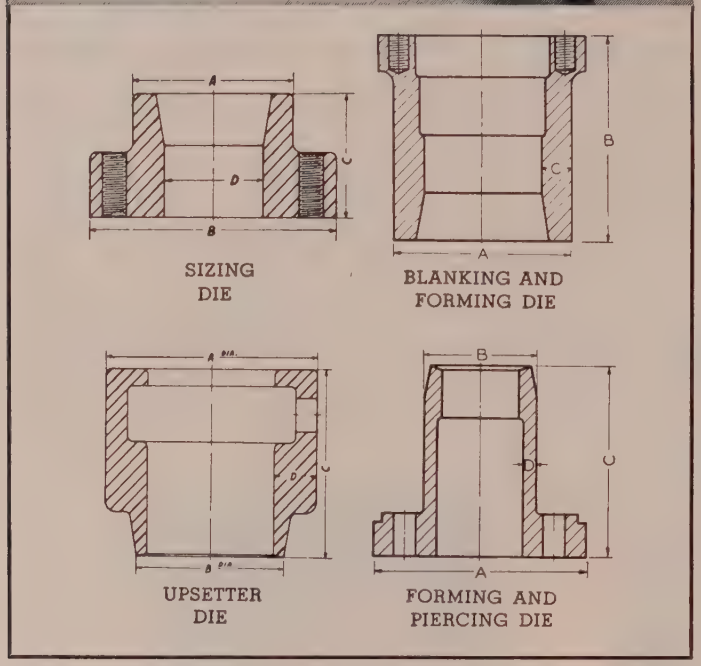
Sealed ball bearings offer the electric motor and machine tool builder many advantages. They simplify design, make it possible to mount motors in any position, cut maintenance to a minimum, and eliminate the need for relubrication for long periods of operation.



WRITE FOR COMPLETE INFORMATION ON NEW DEPARTURE SEALED BEARINGS!

EW DEPARTURE • DIVISION OF GENERAL MOTORS CORPORATION • BRISTOL, CONN.

SPEED PRODUCTION, CUT WASTE WHEN MAKING RING-SHAPED TOOL STEEL PARTS



New Graph-Mo® Hollow-Bar eliminates drilling, machines 30% faster

IF you make ring-shaped tool steel parts, you'll find that you can speed production, cut waste, and save steel by using Graph-Mo® Hollow-Bar. That's because Graph-Mo Hollow-Bar comes with the hole already in it. There's no drilling. You start with finish boring.

And with Graph-Mo Hollow-Bar you get the combination of proved advantages that have made Graph-Mo one of the most popular tool steels: excellent machinability, exceptional wearability, unsurpassed stability.

Actual tests prove that Graph-Mo machines 30% faster than other tool steels. That's because Graph-Mo has free graphite in its structure. And this free graphite gives Graph-Mo less tendency to pick up, scuff, and gall.

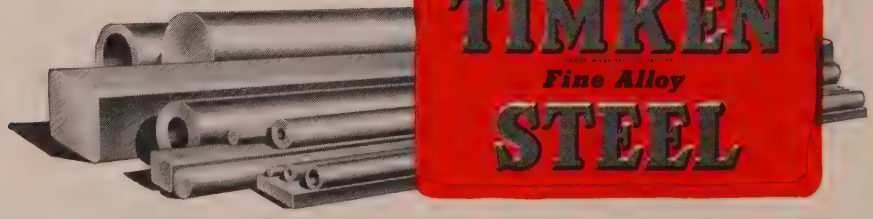
Graph-Mo's amazing wear resistance stems from a combination of graphite and diamond-hard carbides. Reports from users indicate that Graph-Mo outwears other tool steels on an average of three to one.

Graph-Mo also is the most stable tool steel ever made. A master plug gage made from this steel showed less than ten millionths of an inch dimensional change after 12 years in use. And Graph-Mo responds uniformly to heat treatment, too.

Makers of ring-shaped tool steel parts may obtain Graph-Mo Hollow-Bar in sizes from 4 to 16 inches O.D. with various wall thicknesses.

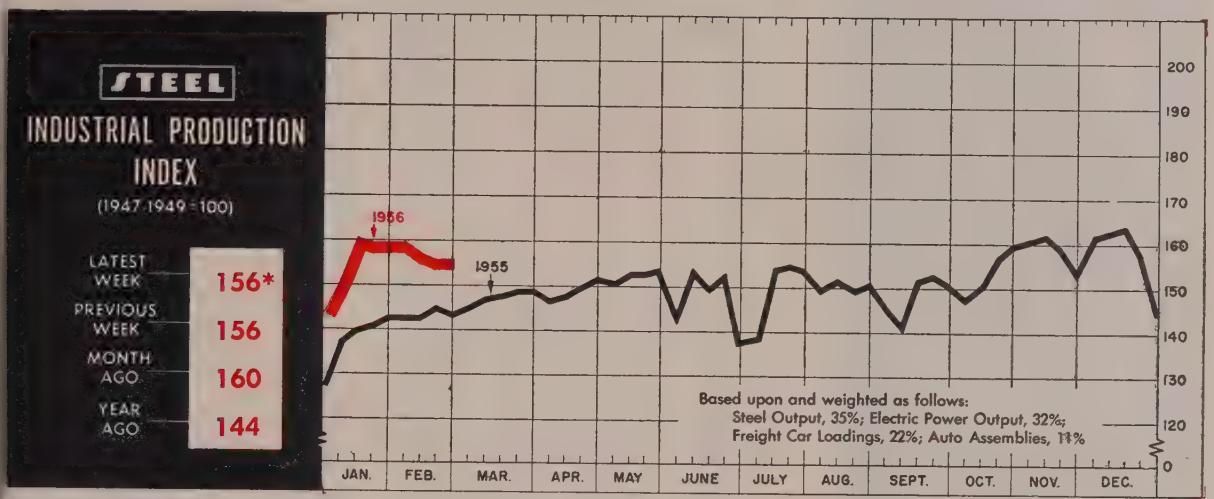
To learn more about Graph-Mo Hollow-Bar, and its application to your problems, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

1956-03-12 138 11


STEEL
INDUSTRIAL PRODUCTION INDEX
(1947-1949=100)
LATEST WEEK 156*
PREVIOUS WEEK 156
MONTH AGO 160
YEAR AGO 144
1956
1955
Based upon and weighted as follows:
Steel Output, 35%; Electric Power Output, 32%;
Freight Car Loadings, 22%; Auto Assemblies, 11%
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
200 190 180 170 160 150 140 130 120 0

*Week ended Feb. 25

Indicators Point to Better Business

BUSINESS is taking a look at some of its old reliable indicators and getting set for what may be even higher levels of activity than it has ever seen.

Machine tool orders continued to set a hot pace in January even though they dipped below the unusually high level of December. National Machine Tool Builders' Association reports new orders last month totaled $118,050,000 compared with $157,950,000 in December. NMTBA officials point out that the latter bookings included some large Air Force contracts. The January total exceeds every month in 1955 except two—November and December. Because of material shortages and manpower problems, shipments last month were only $56,750,000, the lowest in four months. This left the industry with a backlog of 8½ months, the highest since March, 1953. This assures the industry of continued good business through third quarter, independent of any new orders that will come in during that time.

Bellwether—The new order index of the American Supply & Machinery Manufacturers' Association inc. is even more promising. Pegged at 192.7 in January (July, 1948 = 100), it shows a rise of 7 per cent over December's 180.02 mark. This is still below the peak of last year, which occurred in September, but it is higher than that of any other 1955 month.

This index indicates long-range planning by industry. It undoubtedly reflects the build-up in steel (see page 62) as well as expansion programs in other basic industries. It also reflects business confidence in a sustained high level of business in 1956.

Highball — Another good sign for business is the continued strength of railroad activities. Freight car loadings are holding near the 700,000 mark (698,319 for the week ended Feb. 18), and the roads are maintaining heavy car-buying schedules despite the end of fast amortization on new equipment. Typical is the order the

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,422[1]	2,433	2,218
Electric Power Distributed (million kw-hr)	11,300[1]	11,321	9,725
Bitum. Coal Output (1000 tons)	10,100	10,190	8,935
Petroleum Production (daily avg—1000 bbl)	7,045[1]	7,116	6,789
Construction Volume (*ENR*—millions)	$440.1	$268.3	$312.2
Auto, Truck Output, U. S., Canada (*Ward's*)	155,106[1]	158,903	195,079
TRADE			
Freight Car Loadings (1000 cars)	690[1]	698	635
Business Failures (Dun & Bradstreet)	245[1]	252	178
Currency in Circulation (millions)[3]	$30,210	$30,247	$29,793
Dept. Store Sales (changes from year ago)[3]	+6%	+5%	+5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,422	$17,748	$17,903
Federal Gross Debt (billions)	$279.7	$279.7	$278.4
Bond Volume, NYSE (millions)	$17.5	$18.9	$15.6
Stocks Sales, NYSE (thousands of shares)	10,568	10,597	11,502
Loans and Investments (billions)[4]	$84.3	$84.1	$84.7
U. S. Govt. Obligations Held (billions)[4]	$28.5	$28.5	$35.1
PRICES			
STEEL's Finished Steel Price Index[5]	209.10	209.10	194.53
STEEL's Nonferrous Metal Price Index[6]	279.4	272.6	227.3
All Commodities[7]	112.0	112.1	110.3
Commodities Other than Farm & Foods[7]	120.2	120.2	115.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

When steel is 3 times stronger than iron . . .

Has two and one-half times the rigidity . . .

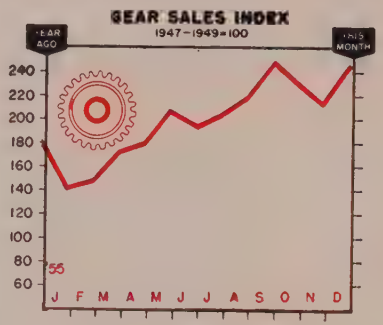
Yet costs a third as much per pound . . .

WHY aren't more of your products designed for welded steel

Ask
THE LINCOLN ELECTRIC COMPANY
Cleveland 17, Ohio

Creating lower costs for industry . . . with welded steel

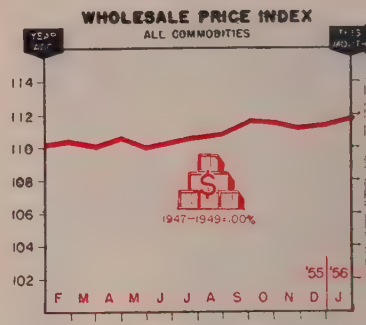
THE BUSINESS TREND



	1955	1954	1953
Jan.	140.9	167.4	161.4
Feb.	148.5	165.1	188.1
Mar.	172.8	128.6	158.9
Apr.	179.8	158.2	217.1
May	205.2	132.5	189.8
June	193.5	127.4	146.5
July	201.7	141.3	120.7
Aug.	217.6	154.7	121.6
Sept.	246.5	135.1	135.6
Oct.	227.6	152.3	211.1
Nov.	210.4	116.7	144.9
Dec.	245.5	182.2	194.0

American Gear Mfrs. Assn.

Charts copyrighted, 1956, STEEL



	1956	1955	1954
Jan.	111.8*	110.1	110.9
Feb.	....	110.4	110.5
Mar.	....	110.0	110.5
Apr.	....	110.5	111.0
May	....	109.9	110.9
June	....	110.3	110.0
July	....	110.5	110.4
Aug.	....	110.9	110.5
Sept.	....	111.7	110.0
Oct.	....	111.6	109.7
Nov.	....	111.2	110.0
Dec.	....	111.4	109.5

U. S. Bureau of Labor Statistics
*Preliminary

Santa Fe placed with Pullman-Standard Mfg. Co. this month for 1175 mill-type gondola freight cars. Delivery will start in second quarter and continue into 1957. Backlog of orders for freight cars now stands at 144,946, says American Railway Car Institute. Standard & Poor's Corp. reports in a special survey of the rail equipment industry that railroad men are talking in terms of ordering 75,000 cars annually for the next five years.

At a time when most persons thought the dieselization program of the railroads was just about completed, the number of new locomotive units on order (835 as of Feb. 1) indicates a further willingness on the part of the roads to continue heavy capital expenditures. The backlog on Feb. 1, 1955, was only 472 units. Class I railroads put in service 126 new locomotives in January compared with 121 in the comparable 1955 month.

STEEL's Index Follows Autos

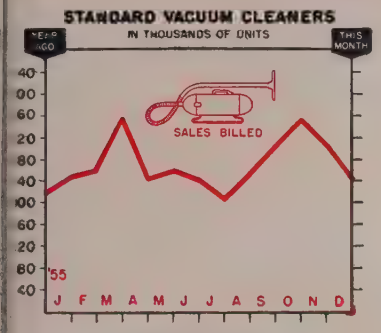
STEEL's industrial production index fails to reflect this business optimism, mainly because of falling auto production. Preliminary estimate for the week ended Feb. 25 is 156 (1947-1949=100), a drop of 5 points from the 1956 high of 161 for the week ended Jan. 14. Automotive accounts for over half of that decline. All other elements of the index have held at near-record levels. Electric power output has held above the 11-billion-kw-hr level for seven weeks in a row. It was only last November that the industry had its first week at that level. The central industrial area continues to show up strong, holding an edge of about 23 per cent over year-ago levels. The Pacific Northwest is coming back into the picture as spring thaws set in.

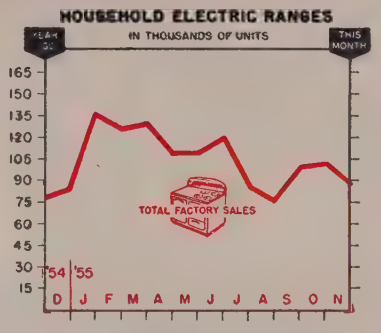
The steel industry has had eight straight weeks of ingot production over the 2.4-million-ton mark. The first week at that level in the industry's history was in November. No letup is in sight.

Freight car loadings consistently have been ahead of corresponding year-ago figures. Cumulative total for 1956 through Feb. 18 was 4,776,409 cars, compared with only 4,429,467 cars for the similar period last year.

PAs See High-Level Business

The monthly survey of business conditions among members of the National Association of Purchasing Agents reflects the high level of





Sales Billed—Units

	1955	1954	1953
Jan.	250,128	221,233	255,886
Feb.	262,851	199,035	246,007
Mar.	358,179	276,464	329,294
Apr.	244,143	220,849	268,545
May	291,238	200,434	262,404
June	241,665	195,781	197,506
July	207,758	193,607	159,446
Aug.	255,540	185,397	188,536
Sept.	308,345	238,235	227,253
Oct.	350,696	263,197	249,383
Nov.	307,545	237,882	216,227
Dec.	243,457	217,022	190,773
Total	3,191,340	2,658,136	2,781,263

Vacuum Cleaner Mfrs. Assn

Total Factory Sales—Units

	1955	1954	1953
Jan.	136,663	101,870	88,145
Feb.	127,188	109,647	114,465
Mar.	130,180	115,393	130,788
Apr.	108,619	92,751	118,999
May	109,268	82,649	114,404
June	120,100	85,854	113,086
July	85,659	80,017	77,836
Aug.	76,158	75,907	74,326
Sept.	101,100	99,611	84,481
Oct.	103,610	84,321	73,422
Nov.	88,290	79,340	55,748
Dec.	.....	85,033	73,870
Total	.....	1,092,393	1,119,570

National Electrical Mfrs. Assn

activity. Respondents to the February query say production was at about the same level as in January. On new orders, the majority (52 per cent compared with 48 per cent last month) think the level is unchanged from a month ago. Sixty-two per cent of the PAs feel that supply-to-demand ratio will improve in the next six months. Only 10 per cent expect it to get worse. This could mean an easing of business. On the other hand, the shortage of materials has been one of the biggest brakes on business, so better availability of materials may mean better business conditions all the way around.

Construction Sets Fast Pace

And still construction activity roars on! Heavy construction awards for the week ended Feb. 23 jumped to $440 million, reports *Engineering News-Record*. This brings the cumulative total for the year to $3374 million, 42 per cent above the corresponding 1955 period. More important is the fact that the rate of increase over last year is getting stronger. At the end of January, 1956 held only a 23-per-cent advantage over 1955. Cement again this year will be a halting factor in heavy construction. Ellery Sedgwick Jr., president of Medusa Portland Cement Co., says it will be in short supply during most of the year.

A dissenting voice in the optimistic construction chorus is the Value Line Investment Survey published by Arnold Bernhard & Co. Inc., New York. The survey believes that a lower level of residential building will offset any advances in public or other private outlays. However, there is a growing feeling in building circles that the housing slump is past and that spring will bring an upswing.

Auto Producers Look to Spring

Auto producers also look with hope to spring. Production will sag even farther in March than it did in the first two months of the year, but producers are looking at February sales figures for a clew as to how far they should cut back. Sales in the Feb. 11-20 period showed surprising strength. The February goal is still about 515,000 units. Even at that, with production estimated at 557,000 units, the dealers' stocks are in for a 40,000-unit boost. If sales run the normal course, this inventory should start declining with the advent of the spring selling spree.

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- Ohioloy Rolls
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- Special Iron Rol
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Plants at Lima and Springfield, Ohio

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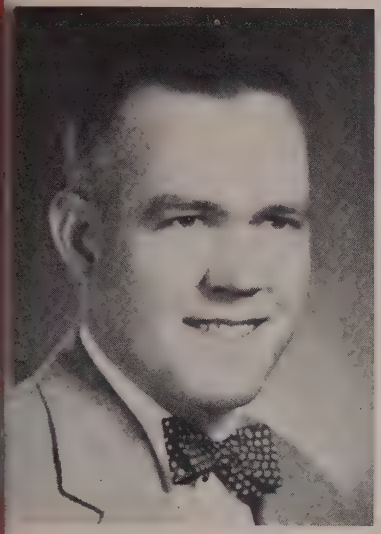
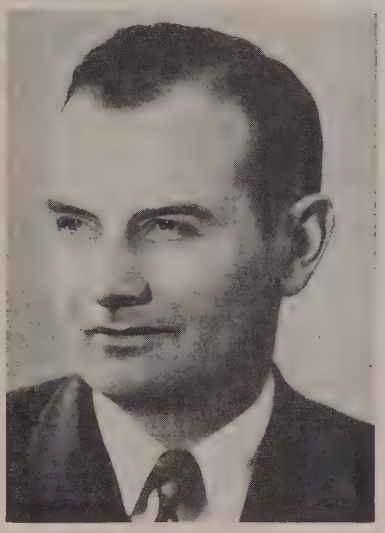


ROBERT L. CHANDLER
. . . Square D plant manager

FREDERICK J. O'REILLY
. . . works mgr. at National Electric



BERNARD DOLAN
. . . Peter A. Frasse & Co. v. p.

Robert L. Chandler was appointed plant manager of **Square D Co.'s** newest manufacturing facility on Twelve Mile Road, Royal Oak Township, Mich. He has held various production and administrative sales assignments and most recently was supervisor of the panelboard, duct and switchboard application section in the Detroit offices.

Dahlstrom Machine Works Inc., Chicago, appointed **Bruce Ballman** executive vice president and general manager, and **Harry E. Stanfield** vice president and assistant general manager. Mr. Ballman was sales manager. Mr. Stanfield was works engineer.

Alfred M. Goodman was made supervisor of quality control for **Acme Steel Co.**, Chicago. He was supervising metallurgist with Inland Steel Co.

W. D. Obenberger was elected vice president and resident manager of the Hartford, Wis., division of **West Bend Aluminum Co.**

Carl McFarlin Sr., chairman of the executive committee of **Devoe & Raynolds Co. Inc.**, Louisville, was elected president to succeed **E. William Endter**, resigned.

M. R. Westover was made assistant to the executive vice president of **Bohn Aluminum & Brass Corp.**, Detroit.

Frederick J. O'Reilly was made works manager at the Elizabeth, N. J., plant of **National Electric Products Corp.** He was plant manager, electrical division, Olin Mathieson Chemical Corp. Mr. O'Reilly succeeds **Henry V. Ivory**, now manager of electronic research and development in charge of a new laboratory at the Elizabeth plant.

Clifford E. Wenninger was appointed technical director of **Hydro-Blast Corp.**, Franklin Park, Ill. He formerly was with National Engineering Co.

S. C. Massari was made director of research by **National Engineering Co.**, Chicago.

C. Foster Brown Jr. was elected to the new post of executive vice president in charge of production and sales for **Ceco Steel Products Corp.**, Chicago. He was vice president and assistant to the president.

Copeland Refrigeration Corp., Sidney, O., elected **W. G. von Meyer** and **Rudy Berg** vice presidents.

Ramon T. Quesilla was named chief engineer of **Ronald Black Co.**, San Diego, Calif.

Frank B. Jewett Jr. was elected a vice president of **Vitro Corp. of America**, New York. He was with General Mills Inc.

Bernard Dolan was elected vice president of **Peter A. Frasse & Co. Inc.**, New York. He has successively held posts in the purchasing, advertising and sales departments of the company, and was made assistant vice president in 1955.

MacLean-Fogg Lock Nut Co., Chicago, appointed **Harry Bishop** general sales manager, industrial division. He was Detroit area manager of the company.

Milton E. Morgan fills the new post of director of purchases at **A. O. Smith Co.**, Milwaukee. He was assistant general sales manager of automotive products.

Leo G. Jacques and **Leo F. Brown** were elected vice presidents of **Allied Products Corp.**, Detroit.

Paul Bixler was made manager, international division, **F. J. Stokes Machine Co.**, Philadelphia.

James F. O'Donnell was made production manager and **Harold Thom** factory superintendent, **Goddard & Goddard Co.**, Detroit.

Fenton D. Lapham was promoted to director of production control and purchasing, **Electro-Motive Division**, General Motors Corp., La Grange, Ill. He succeeds **William O. Nelson** who assumes special duties on the general manager's

ROBERT B. HEPPENSTALL

JOHN P. ROCHE

HARRY W. DAVIDSON

Midvale-Heppenstall president and vice presidents

staff. **Charles F. Lincoln Jr.** succeeds Mr. Lapham as parts supply manager for the division.

David A. Schiffer was promoted to eastern manager of raw material purchases for **Apex Smelting Co.**, Chicago. **Eric Windmiller** was made assistant eastern manager. They are located at Cleveland.

William Doonan was made midwestern sales manager by **Cleveland Instrument Co. Inc.** He has headquarters at Ypsilanti, Mich.

Carl O. Hedner was made assistant general sales manager, materials handling division, **Yale & Towne Mfg. Co.**, Philadelphia.

Harry L. Sturla Jr. was made manager of the market research department of **Joseph T. Ryerson & Son Inc.**, Chicago. He was assistant manager. At the New York steel service plant, **John J. Hauptly** was made acting manager, inside sales department. He is replaced as manager of alloy steel sales by **Richard L. Smith. Edward J. Byers** succeeds **Henry B. Williams** as manager of tubular products and cold finished bar sales at New York. Mr. Williams was promoted to sales manager.

Lawrence P. Baker was named sales manager and **Marshall A. Pease** director of new products development for Pressed Metal Division, **Stanley Works**, New Britain, Conn.

Officers of the recently created **Midvale-Heppenstall Co.**, Philadelphia, are. **Robert B. Heppenstall** president; **John P. Roche** and **Harry W. Davidson** vice presidents; **A. O. Schaefer**, director of research; **Howard H. Casey**, general superintendent and manager of engineering; **Herman A. De Pova**, works manager; **Derek G. R. Brigg**, general sales manager; and **Lloyd R. Loewen**, secretary-treasurer.

At **General Electric Co.'s** new gear motor and transmission components department at Paterson, N. J., **Robert L. Spitler** was made manager of manufacturing; **Ralph E. Coutant**, manager of engineer ing; **Robert E. Kelley**, manager finance; and **Howard W. Bennet** manager of marketing.

A. K. Ferguson was elected a vi president of **F. H. McGraw & Co** New York. He was formerly pre ident of H. K. Ferguson Co. an more recently was an officer Walter Kidde Construction Co.

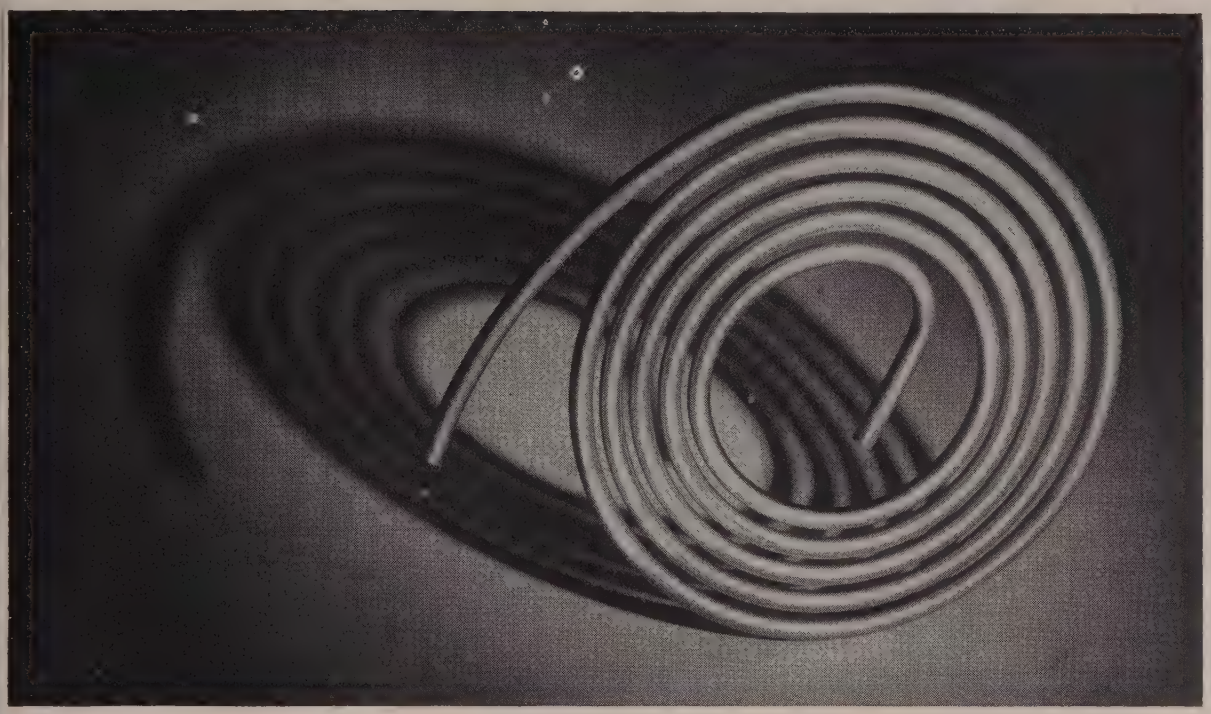
Charles F. Venrick was made Ch cago district sales manager **American Car & Foundry Divisio** ACF Industries Inc.

Joseph W. S. Davis succeed **Charles F. Venrick** as western r

LAWRENCE P. BAKER

MARSHALL A. PEASE

. . . appointments at Stanley Wks., Pressed Metal Division



Superior offers the widest range of sizes and alloys in top quality instrument tubing

Superior Tube Company produces the finest instrument tubing in a wide range of sizes and alloys—offers you as standard products what many makers would classify as specialty tubing.

1. NEEDLE TUBING

The stainless steel links in this recording instrument are made of Superior needle tubing. The high strength, stiffness, and strict dimensional tolerances characterizing this tubing—originally designed for surgical uses—have opened new fields of industrial applications when used as mechanical tubing.

2. PRESSURE AND SUPER PRESSURE TUBING

A spiral windpipe made of Superior 304 cold-drawn seamless stainless steel tubing. Pressure tubes are used to convey fluids at elevated temperatures and pressures. Produced in stainless, carbon and alloy steels in sizes to withstand pressures up to 100,000 psi.

3. BOURDON TUBING

A "C" tube element for a pressure gage. The shaped Bourdon tube serves as the actuating element for the majority of pressure indicating and recording instruments. Helix and spiral elements are also fabricated from the wide range of alloys available at Superior—a range that makes it possible to satisfy any set of conditions in the use of Bourdon tubing.

4. CAPILLARY TUBING

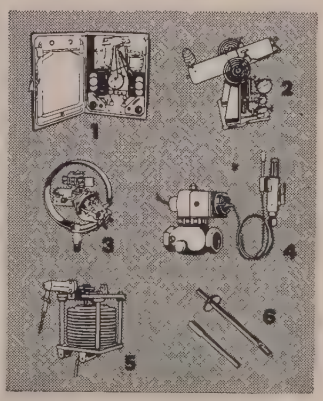
A thermostatic instrument pressure transmission element with a coiled unit made of Superior Type 321, capillary tubing. Superior capillary tubing is used primarily for transmitting temperature and pressure impulses from the source to a recording or indicating instrument. Capillary purposes, in general, require a heavy-wall tube with an ID of .006″ to .030″. Types 347, 321, 316, MONEL* and carbon steels are recommended analyses.

5. LARGE OD LIGHT WALL TUBING

A large OD light wall tubing bellows in a pressure actuating element. Present applications for large OD light wall tubing include bellows, low pressure heat exchanger tubes, flexible hose, aircraft ducting, fractional horsepower motor casings, ceramic drills, and casings for radioactive well logging instruments. Sizes offered up to 2½″ OD.

6. MECHANICAL TUBING—INSTRUMENT LINE

Various fabricated parts—all made of Superior mechanical tubing. Superior mechanical tubing can be either seamless or WELDRAWN† grade used statically or dynamically, but not subjected to severe temperature or pressure. It is produced in sizes up to ⅝″ OD within production limits, in many special shapes, and in over 63 standard analyses and mechanical properties.



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Round and shaped tubing available in Carbon, Alloy and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium

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All analyses .010″ to ⅝″ OD—certain analyses in light walls up to 2½″ OD

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*Reg. T.M. International Nickel Co.
†Reg. T.M. Superior Tube Co.

WILBUR E. KELLEY
. . . heads Walter Kidde Nuclear Lab

ADOLPH F. LEITNER
. . . Ralph C. Coxhead exec. v.p.

WILLIAM S. FORREST
. . . National Motor Bearing sales post

gional manager, **Alco Products Inc.** He is at Chicago.

Wilbur E. Kelley was elected president of **Walter Kidde Nuclear Laboratories Inc.**, Garden City, L. I., N. Y. He succeeds **Henry K. Norton** who continues on the board of directors. Mr. Kelley was manager of the New York operations office of the U. S. Atomic Energy Commission, and since 1953 has been vice president-engineering for Catalytic Construction Co.

John W. Anne, for several years vice president in charge of headquarters application engineering for **Elliott Co.**, Jeannette, Pa., was assigned additional duties. He is now responsible for manufacturing operations of the Jeannette Division.

John W. Gudgel was named to the new post of vice president-general manager of manufacturing of **Ross Heat Exchanger Division**, American Radiator & Standard Sanitary Corp., Buffalo.

Adolph F. Leitner was elected executive vice president of **Ralph C. Coxhead Corp.**, Newark, N. J. He formerly was vice president of Dwight Lloyd Division, McDowell Co. Inc., and also served as executive vice president of Sintering Machinery Corp.

Thomas J. Quinn was made general sales manager, **Grobet File Co. of America Inc.**, Carlstadt, N. J.

Frank J. Thomas was made superintendent of steel conservation and quality control at the Cleveland plant of **Republic Steel Corp.** He succeeds the late **Thomas J. Woods. Robert A. Saxer** was named assistant superintendent.

Charles C. Wiedmann was promoted to general manager, **AMF Tool Division**, American Machine & Foundry Co., New York. He was assistant sales manager.

Clifford R. Kral was appointed production manager, machine division, **Torrington Mfg. Co.**, Torrington, Conn.

William S. Forrest was named industrial division sales manager, **National Motor Bearing Co. Inc.**, Redwood City, Calif. He was assistant to the director of sales.

W. B. Heinz was made chief engineer of **Askania Regulator Co.**, Chicago. He was owner of Heinz Engineering Co., Arlington, Va.

R. T. Sturgeon was elected president and chairman of **Hollydale Mfg. Co.**, Hollydale, Calif.

Elbert M. Palmer was elected president, **Kawanee Boiler Division**, American Radiator & Standard Sanitary Corp., Kewanee, Ill. He succeeds **W. Bradford Russell**, retired. Mr. Palmer was executive vice president.

Frank L. Grumbach succeeds **Lloyd A. Burkholder**, retired, as Cleveland district sales manager for **Republic Steel Corp.'s** Berger Division. **Robert H. Egan** was made division industrial engineer in Canton, O., to succeed **C. J. Russell** who will be reassigned.

OBITUARIES . . .

Keith Williams, 66, general manager, **Pratt & Letchworth Division**, Dayton Malleable Iron Co., Buffalo, died Feb. 15.

A. Oram Fulton, 70, chairman, **Wheelock, Lovejoy & Co. Inc.**, Cambridge, Mass., died Feb. 20.

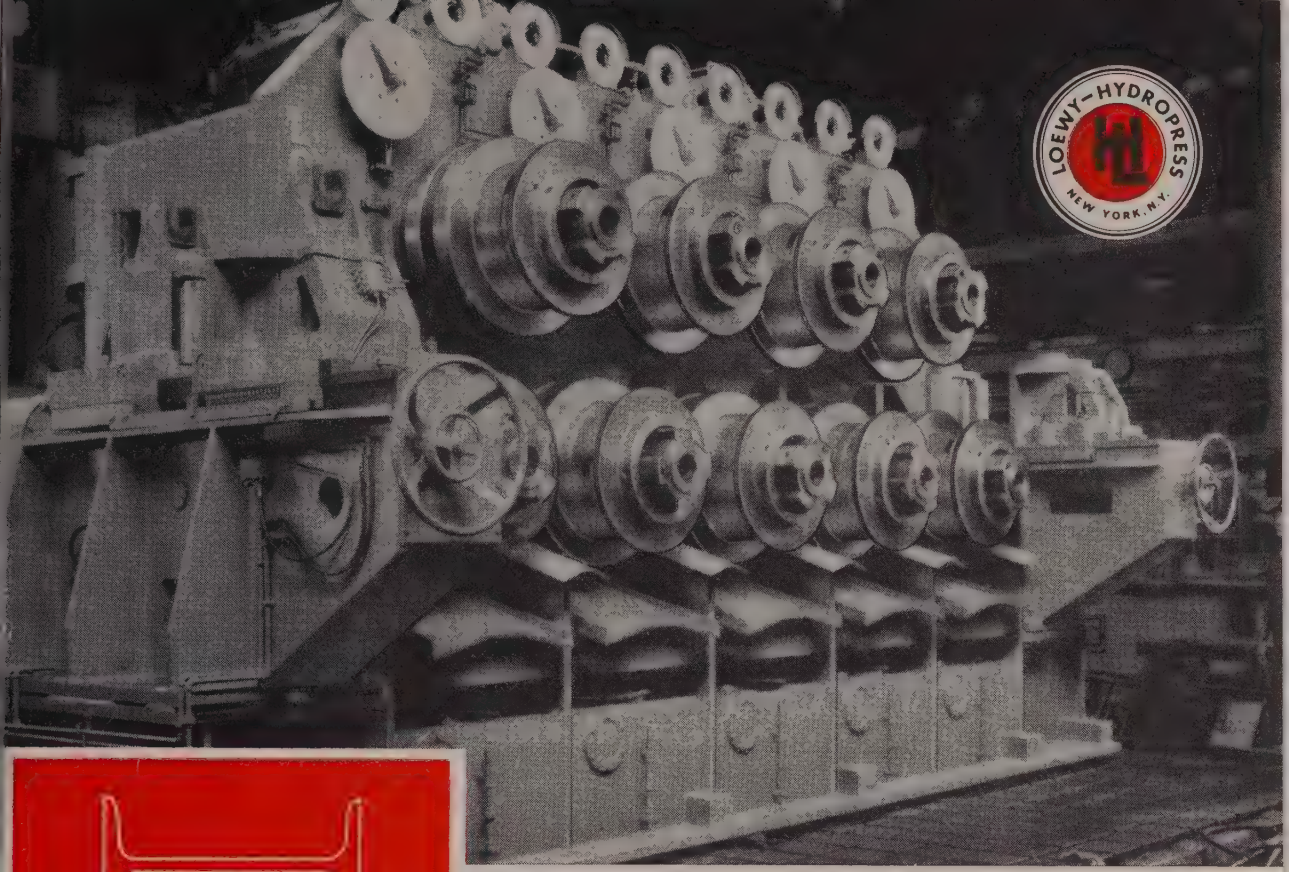
Charles L. Leitner, 60, purchasing agent for **St. Louis Screw & Bolt Co.**, St. Louis, died Feb. 12.

Albert Christensen, 81, president, **Christensen & Olsen Foundry Co.**, Chicago, died Feb. 18.

Richard M. Wick, 53, assistant director of research at **Bethlehem Steel Co.**, in charge of tin plating plants, died Feb. 18 in Baltimore.

William M. Reck, 64, sales engineer of **Bethlehem Steel Co.** in New York, died Feb. 19.

John J. Kelly, 67, a partner in **Niagara Metal Co.**, Buffalo, died Feb. 16. He retired last month.



new LOEWY roller straightener produces more tonnage to closer tolerances

Structural sections, sheet pilings, wide flange beams and heavy rails can be straightened to tolerances well above commercial standards with the new 1956 Loewy roller straightener. This efficient machine operates at speeds up to 500 FPM, and its production capacity is high, i.e. 20 lb. beams can be straightened at the rate of 1,320 tons per 8 hour shift and 73 lb. beams at the rate of 2,200 tons per 8 hours.

Other advantages you get with this new Loewy straightener are:

- **All welded rigid construction.**
- **Anti-friction bearings throughout.**
- **Motor driven, power operated vertical rollers supported on both sides in roller bearings.**
- **Remote control of vertical and horizontal roll adjustment, with accurate selsyn indicators mounted conveniently on pulpit.**
- **Quick roll changing.**

Loewy roller straighteners are in use in modern steel mills in the United States and abroad. The new model 1956 offers so many advantages over earlier designs that it is truly "*the design of tomorrow . . . today.*" For more information about this precision equipment, write to us at 350-A Fifth Avenue, New York 1, N.Y.

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SUBSIDIARY OF Penn-Texas CORPORATION

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN DISTRICT OFFICES: New York, Washington, Pittsburgh, Cleveland, Chicago, Denver, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston

West Gets Strip Mill

Los Angeles plant of Cold Metal Products Co. will produce specialty flat-rolled steel

COLD-ROLLED STRIP steel will be produced in Los Angeles by a subsidiary of Cold Metal Products Co., Youngstown. Carbon, alloy and stainless steel grades will be made.

Cold Metal Products Co. of California will install equipment similar to the cold rolling mills operated by the parent company in Youngstown, Indianapolis and Kenilworth, N. J. These 4-high single-stand reversing mills are particularly useful in the production of cold-rolled strip steel where restricted gage tolerance, special finishes and uniformity are important.

Annealing facilities will be similar to those employed in the other plants. In combination with the CMP-type of cold rolling process, they make possible unusually uniform control of structures and other physicals. Slitting equipment, designed and built by CMP, cut-to-length lines and edging equipment, now a part of the warehouse service, will round out the production units.

Western customers have been getting most of their specialty products from the Midwest and East.

Product Range — Cold Metal Products' Los Angeles plant (2131 S. Garfield Ave.) has been operated exclusively as a distributor of steel and metal products, principally in the flat-rolled category. It has maintained a complete line of cold-rolled strip steel in low carbon and high carbon grades and such specialties as tin coated and zinc coated steel, in coils and cut lengths; tempered spring steel; alloy and stainless, high-tensile strip steel. A wide range of Armco stainless sheets, strip, plates and bar is regularly carried in stock for resale.

The new strip steel production facilities are to be housed on the same site. The plant will supplement and in some instances replace the specialty cold rolling facilities at the company's eastern plants.

For customers who need immediate, off-the-shelf service, the Warehouse Division will continue its operations. The identity of the Warehouse Division and Mill Division will be separately maintained and staffed by specialized organizations. Both divisions will be under the general management of E. L. Phillips, vice president.

The new building and production equipment are under construction. Completion of the project before summer is anticipated.

Will Build in Connecticut

American Radiator & Standard Sanitary Corp., will build an $8-million plant at Plainfield, Conn. Production is scheduled to start early in 1957.

Cleaver-Brooks Forms Unit

Cleaver-Brooks Co., Milwaukee, organized Cleaver-Brooks Western Hemisphere Ltd. to expedite marketing of its products in this hemisphere. The company makes self-contained steam and hot-water boilers, industrial oil burners, evaporators, distillation equipment and heating equipment for road construction and ready-mix plants. R. P. Honnold is vice president in charge of the new corporation and will continue as export manager of the parent company.

Opens Stud Welding Office

K S M Products Inc.'s Stud Welding Division, Merchantville, N. J., opened a district office at 1615 Polk St., San Francisco. F. G. Kern is district engineer.

Cast Iron Pipemaker Expands

A $5-million expansion of manufacturing facilities has been launched by James B. Clow & Sons Inc., Chicago, one of the nation's leading producers of cast iron pressure pipe. The central project is a cast iron pipe plant to be built in Bensenville, Ill., having 150,000 sq ft of floor space and a capacity of 80,000 tons of pipe a year. An administration building also will be erected on the plant site.

Other phases include modernizing the fittings foundry at its Birmingham plant and the purchase of additional land and buildings

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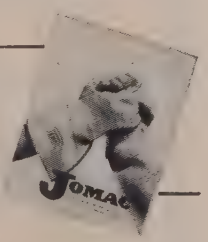

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Big Bridge Bearing

Workmen at the Ambridge, Pa., plant of U. S. Steel's American Bridge Division assemble one of two 15-ton brass bearings for a bridge that will span the Cuyahoga river at Cleveland

adjacent to its general offices and warehouse in Chicago to expand jobbing operations.

West Coast Firm Sold

Dorr - Oliver Inc., Stamford, Conn., acquired Merco Centrifugal Co., San Francisco, manufacturer of centrifuges, centrifugal screens and strainers.

Stapling Wire Firm Expands

Bostitch Inc., manufacturer of stapling wire and stapling-wire stitching machines, is building a 400,000-sq-ft plant at East Greenwich, R. I. The new plant will replace present quarters at Westerly, R. I.

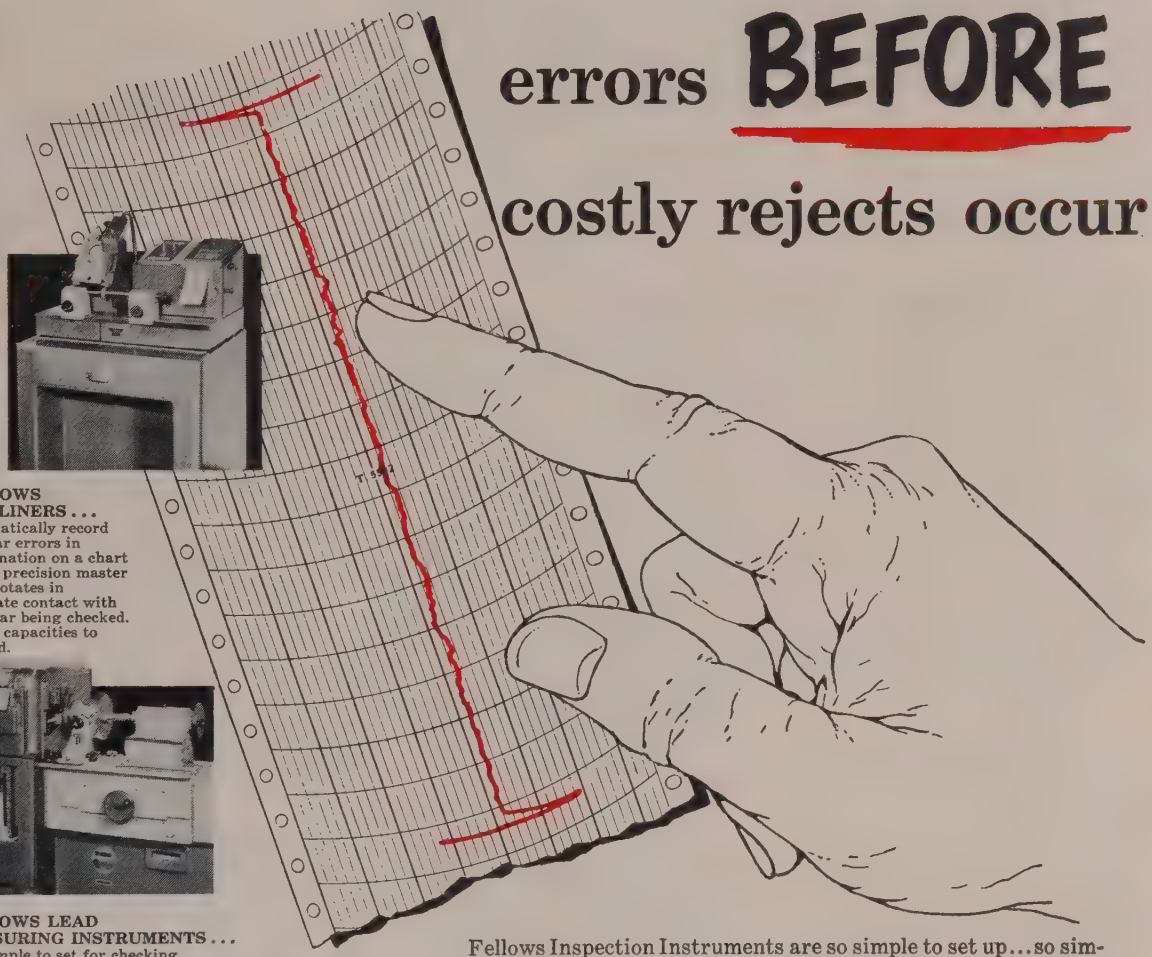
Plans Multimillion Projects

A multimillion-dollar expansion of International Business Machines Corp.'s west coast operations was announced by T. J. Watson Jr., president. The program includes: An office building and data processing center in Los Angeles; new manufacturing, engineering and education facilities at San Jose, Calif.; an office building in Santa Monica, Calif.; data processing centers in Seattle and Portland, Oreg.; an office building now nearing completion in San Francisco.

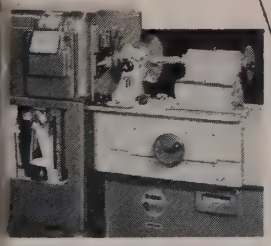
IBM also will establish manu-

Fellows Gear Inspection Instruments

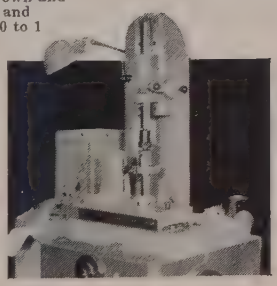
Put your finger on all gear errors BEFORE costly rejects occur



FELLOWS SHAPED LINERS . . . automatically record all gear errors in combination on a chart as the precision master gear rotates in intimate contact with the gear being checked. Three capacities to 8" p.d.



FELLOWS LEAD MEASURING INSTRUMENTS . . . are simple to set for checking various leads—also check crown and taper. Two capacities: 12" and 24" p.d. Chart errors at 500 to 1 magnification.



FELLOWS INVOLUTE MEASURING INSTRUMENTS . . . measure involute profiles—also location and amount of any involute modifications. Electronic recorders provide permanent chart records at 500 to 1 magnification. 12" and 24" capacity models.

Fellows Inspection Instruments are so simple to set up . . . so simple to use! Yet their accuracy assures positive quality control during production runs—finds and identifies gear errors before expensive hours of machine time and labor are wasted—prevents waste of costly material.

Whether you're making fine-pitch gears or large coarse-pitch ones . . . for your own use or for a customer . . . Fellows instruments give chart-recorded proof that specified gear limits have been met.

A Fellows Representative will be glad to show you how Fellows Gear Inspection Instruments can assure accurate and dependable control over the manufacture of high quality gears at the lowest possible cost.

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2206 Empire State Building, New York 1
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THE PRECISION LINE **Fellows** *Gear Production Equipment*

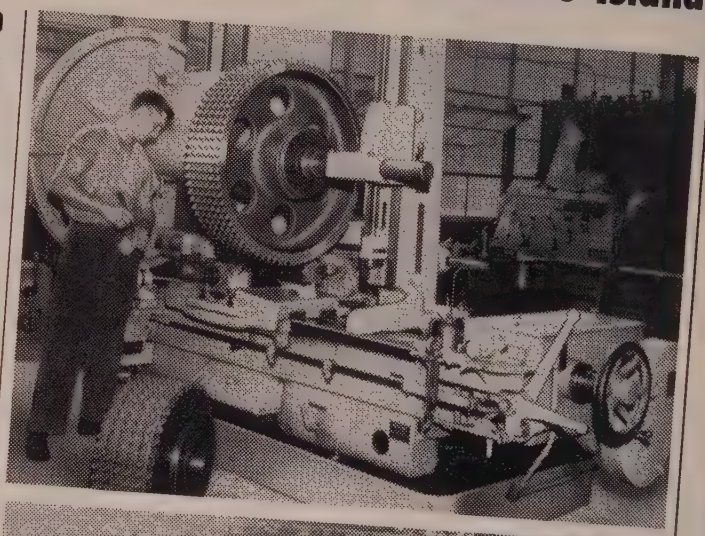
in case you missed the News!

Newark Gear Cutters and Hobbers

are now manufactured by POTTER & JOHNSTON COMPANY at the P&J plant, Pawtucket, Rhode Island

TO AVOID DELAYS AND TO INSURE PROMPT ATTENTION AND HANDLING, PLEASE ADDRESS ALL INQUIRIES AND ORDERS DIRECT TO POTTER & JOHNSTON AT PAWTUCKET.

As previously announced, assets of the Newark Gear Company have been acquired by Potter and Johnston Company, subsidiary of Pratt & Whitney Company, Incorporated. In addition to the complete line of P&J Automatic Chucking Turret Lathes, these long-famous automatic gear machines are now being manufactured in our Pawtucket, Rhode Island plant. Product literature, including complete specifications and engineering data, is available. Write on your Company letterhead outlining your requirements.



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P&J CUTTERS NEWARK GEAR HOBBERS

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facturing, engineering and educational facilities in Rochester, Minn. Construction of several buildings, comprising 400,000 sq ft of floor space and costing about $8 million, is scheduled to begin late this year. Electric and electronic accounting machines and new products under development will be produced.

Buys Air Conditioning Firms

A group of San Francisco investors purchased Portable Air Cooler & Heater Inc. and its marketing organization, Chico Air Cooler Distributors, Chico, Calif. Alf E. Werolin is president of Portable Air Cooler; G. R. Sommers, president of Chico Air Cooler.

Plans Stamping Plant in East

S. O. & C. Co., a division of United Shoe Machinery Corp., will build a 100,000-sq-ft plant at Shelton, Conn. The division, producer of industrial eyelets and related stamped products, will move some presses to Shelton from its Ansonia, Conn., plant.

Enlarges Tractor-Shovel Plant

Frank G. Hough Co., Libertyville, Ill., is constructing a 55,000-sq-ft addition to its plant for the manufacture of tractor-shovels and allied equipment. When completed, the plant will contain 368,000 sq ft of floor space.

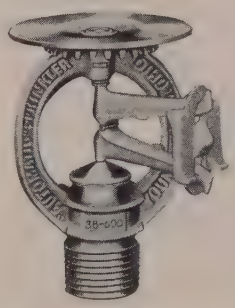
True Temper Plans Expansion

True Temper Corp., Cleveland, will erect a plant in Saybrook township, between Ashtabula and Geneva, O., for the exclusive production of garden, lawn and farm tools. The $3.5-million project is the biggest expansion in the history of the company. The Saybrook unit will include stamping operations, now a partial function of the firm's plant at Conneaut, O.

Forms Grinding Wheel Division

A new product engineering department has been established for the Grinding Wheel Division of Electro Refractories & Abrasives Corp., Buffalo. As head of the

Fire Safety In Action . . .



You're looking at an "Automatic" SPRAY Sprinkler an instant after fire has triggered it into action. The deluge of water will snuff out a blaze before it has a chance to gain headway. Millions of these ingenious devices provide a 24-hour-a-day fire watch in tens of thousands of industrial, commercial and institutional buildings throughout the land.

You, too, should let "Automatic" Sprinklers serve as your personal fire department. They will afford you the best practical measure of fire safety with the least effort, expense and interference with your business operation.

Complete descriptive literature now available.
For data on "Automatic" Sprinkler systems, write for Bulletin 66.
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Two New Catalogs Answer Your Needs For Door Efficiency

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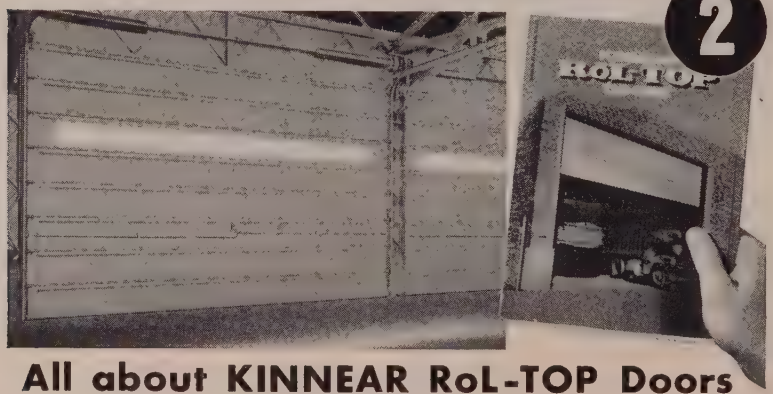
KINNEAR Steel Rolling Doors

— with the coiling upward action of interlocking steel slats *(originated by Kinnear)* — are illustrated and described here in every detail. Also complete data on Kinnear Steel Rolling Fire Doors *(labeled by Underwriters' Laboratories, Inc.)* and the upward-acting Kinnear Steel Rolling Grilles, the attractive steel-bar-and-link protection that admits light, air and vision. Full details on Kinnear Motor Operators, too!



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department, William Eames will study and collect data on grinding wheel tests in various plants throughout the country; introduce and evaluate new products; work with salesmen, distributors and jobbers in grinding wheel education and customer contacts.

Long-Range Planning

ROBBERSON Steel Co. is moving, but the transfer will require an estimated ten years.

An enlarged plant will be constructed at Reno avenue and MacArthur boulevard, Oklahoma City, Okla., at a cost of between $2 million and $3 million. The tentative schedule for moving the various departments is: First, culvert-making facilities; second, foundry; third, steel joist and roofing sections. Construction of the first unit will start this year.

Rowe Buys Bumpers Inc.

Rowe Methods Inc., Cleveland, manufacturer of hydraulic dock leveling devices, purchased Bumpers Inc., that city, maker of reversible dock and truck bumpers.

Taylor Devices Inc. Formed

Paul H. Taylor organized Taylor Devices Inc., a manufacturing company, and Tayco Developments Inc., a research company, 188 Main St., North Tonawanda, N. Y. The organizations will manufacture and develop compressible material devices.

Horsburgh & Scott Expands

Horsburgh & Scott Co., Cleveland, completed a 22,000-sq-ft plant addition. The firm specializes in speed reducers and gears.

Eberhart-Denver Changes Hands

Borg-Warner Corp.'s subsidiary, Morse Chain Co., Chicago, purchased Eberhart-Denver Co., Denver, and its affiliate, Spreco Co., Chicago. Officers of Eberhart-Denver, a leading maker of speed reducers, are: Fred Eberhart, chairman; S. J. Roush, president;

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ROLLED STEEL RINGS

Rolled accurately to size and shape from solid blocks of steel, Edgewater Rolled Steel rings need a minimum of machining. The saving in time and material can be very substantial, especially when complex cross-section shapes are required. We will be glad to help you make designs that will gain for you the maximum advantages of the Edgewater process. Diameters, 5 inches to 145 inches.

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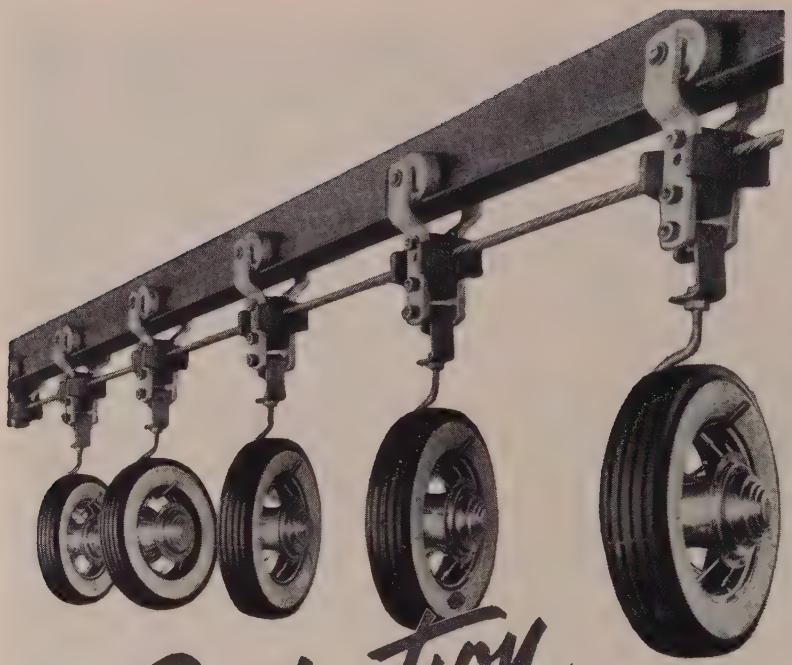

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going your way
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Fabricated from stocked component parts, Buschman "Universal" cable conveyors permit "customized" installations at standard prices. Their compact construction . . . shorter radius turns and dips . . . save production space.

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World's Most Complete Line of Conveying Equipment

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Write for Bulletin 40 for complete details.

Robert Bass, vice president and general manager; J. R. Mueller, vice president and chief engineer; M. V. Bailliere Jr., secretary-treasurer.

Distributor Enlarges Facilities

Southwestern Ohio Steel Inc., Hamilton, O., is enlarging and remodeling its flat rolled warehousing area and installing additional overhead cranes. Estimated cost is $100,000. In January, Southwestern added a Cincinnati ½-in. 10-ft plate shear to its plate cutting department.

Forms Electronics Division

Weber Aircraft Corp., Burbank, Calif., formed an Electronics Division as a part of its diversification program. J. H. Doyle is division manager; J. T. Revis, chief sales engineer.

Cutler-Hammer Expands in West

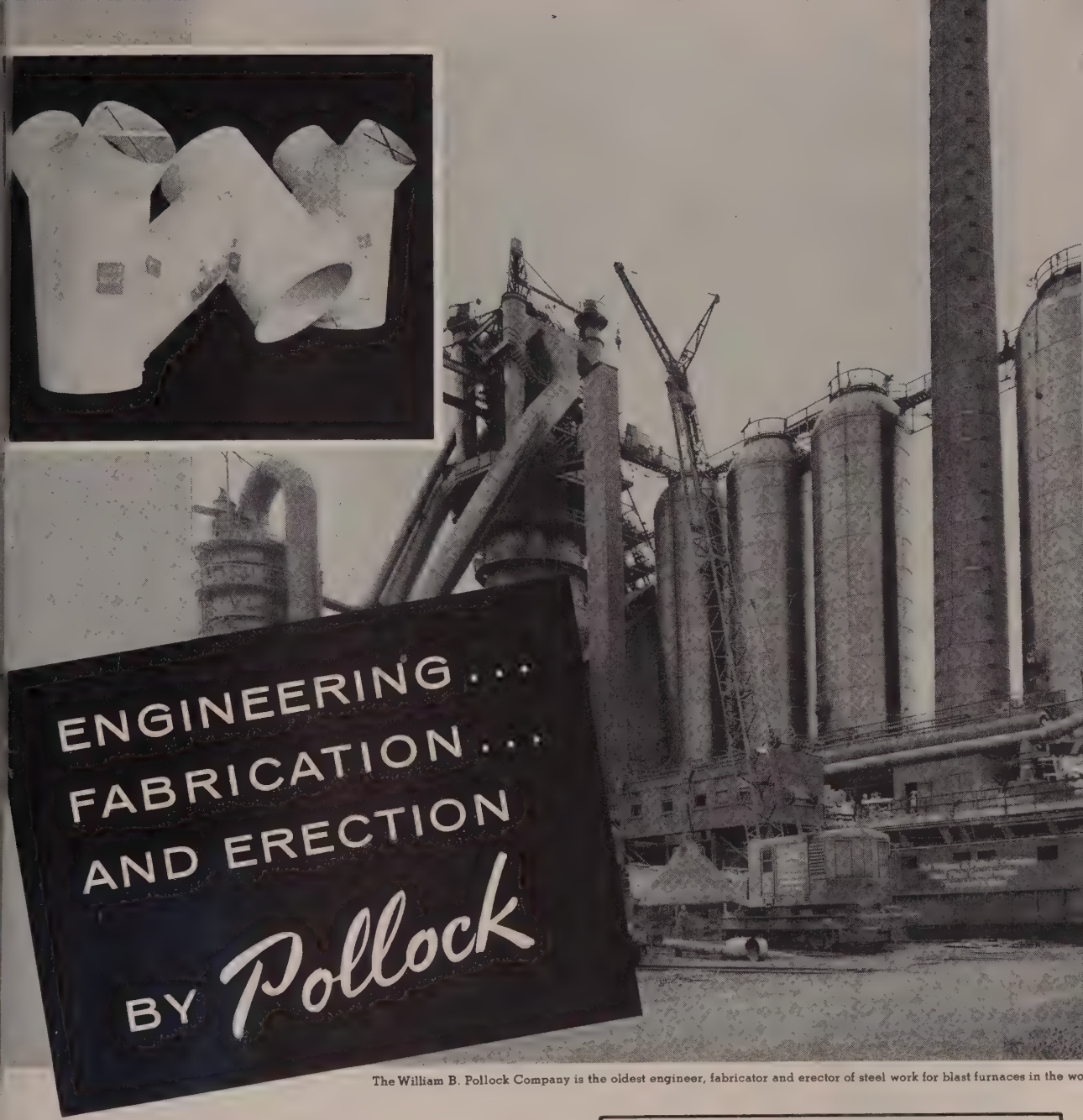
Cutler-Hammer Inc., electrical manufacturer, Milwaukee, completed a plant in the central manufacturing district of Los Angeles. It will house manufacturing and warehousing facilities, as well as the firm's Los Angeles district sales office.

REPRESENTATIVES

H. K. Porter Company Inc.'s Laclede-Christy Co. Division, St. Louis, appointed H. D. Roach as its Chicago sales representative. The division makes refractories.

Kurt Orban Co. Inc., New York, importer of German machine tools, appointed Superior Sales & Engineering Co., Orange, N. J., its sales representative for northern New Jersey.

Taft-Peirce Mfg. Co., Woonsocket, R. I., appointed these agents to handle its standard lines of fixed gages, air gages, small tools and magnetic chucks: General Tool Co., Portland, Oreg.; Industrial Tool & Supply, Tucson, Ariz.; Charles K. Farley, Rochester, N. Y. The firm also appointed Joseph Monahan Co., Grand Rapids, Mich.,



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Only a few companies in the world can engineer, fabricate and erect the steel work for a complete blast furnace, and The William B. Pollock Company is one of them. Over the years Pollock has erected more blast furnaces than anyone in the world. We're specialists in heavy steel work, fully equipped to engineer and fabricate plate and structural requirements and do heavy machine work on castings and weldments.

Pollock engineers are at your service. Use them. They'll analyze your needs and suggest the most practical, efficient and economical solutions.

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Engineers • Fabricators • Erectors
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BLAST FURNACES • HOT METAL CARS AND LADLES
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Fill in and mail the attached coupon immediately. We'll treat it confidentially; reply without delay. Your action now may be the first step toward a far better future for you and your family.

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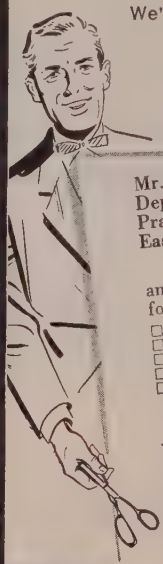

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☐ Structures
☐ Afterburners and Related Equipment
☐ Aerodynamics
☐ Hydraulics
☐ Gears
☐ Valves
☐ Heat Exchangers and Combustion Problems
☐ Bearings
☐ Piping
☐ Controls
☐ Test Equipment
☐ Test Rigs

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ADDRESS .....

CITY ..... STATE .....

PRATT & WHITNEY AIRCRAFT
Division of United Aircraft Corporation
East Hartford 8, Connecticut

World's foremost designer and builder of aircraft engines

to handle its precision machine tools in that area.

Mechanical Air Controls Inc., Detroit, appointed these representatives to handle its air valves in their respective districts: J. Neill Armstrong Inc., New York city; Fred McAvoy, Grand Rapids, Mich.

Alloy Steels Inc., Detroit, will represent Firth Sterling Inc., Pittsburgh, producer of high-speed steels, in that area.

Ampco Metal Inc., Milwaukee, appointed these distributors for its weldrod department: Miami Welding Supply Inc., Miami, Fla.; Kaminis Welding Supplies Inc., Tampa, Fla.; Keenan Welding Supplies Co. Inc., Albany, Ga.

George Sall Metals Co. Inc., Philadelphia, appointed William E. McCullough as sales and service representative for the western Pennsylvania area. His headquarters are in Pittsburgh. Sall makes specification aluminum, brass and bronze, zinc alloys and additives.

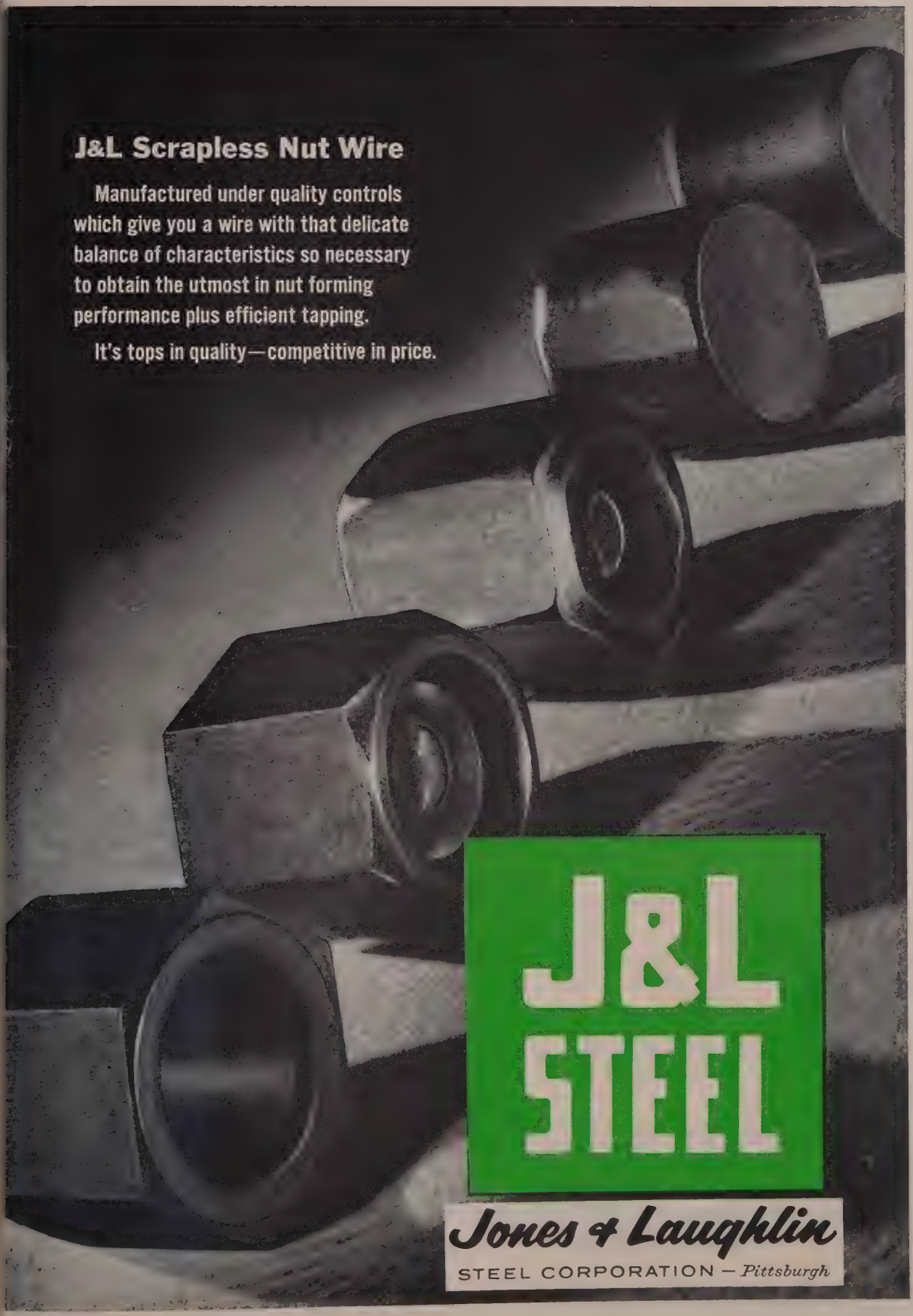
Henry Upjohn Co., Kalamazoo, Mich., and C. B. Kopecky Co. Inc., Syracuse, N. Y., have been appointed sales representatives for **Hartford Special Machinery Co.,** Hartford, Conn. The firm makes drilling and tapping machines, machine components, thread rollers and die polishing machines.

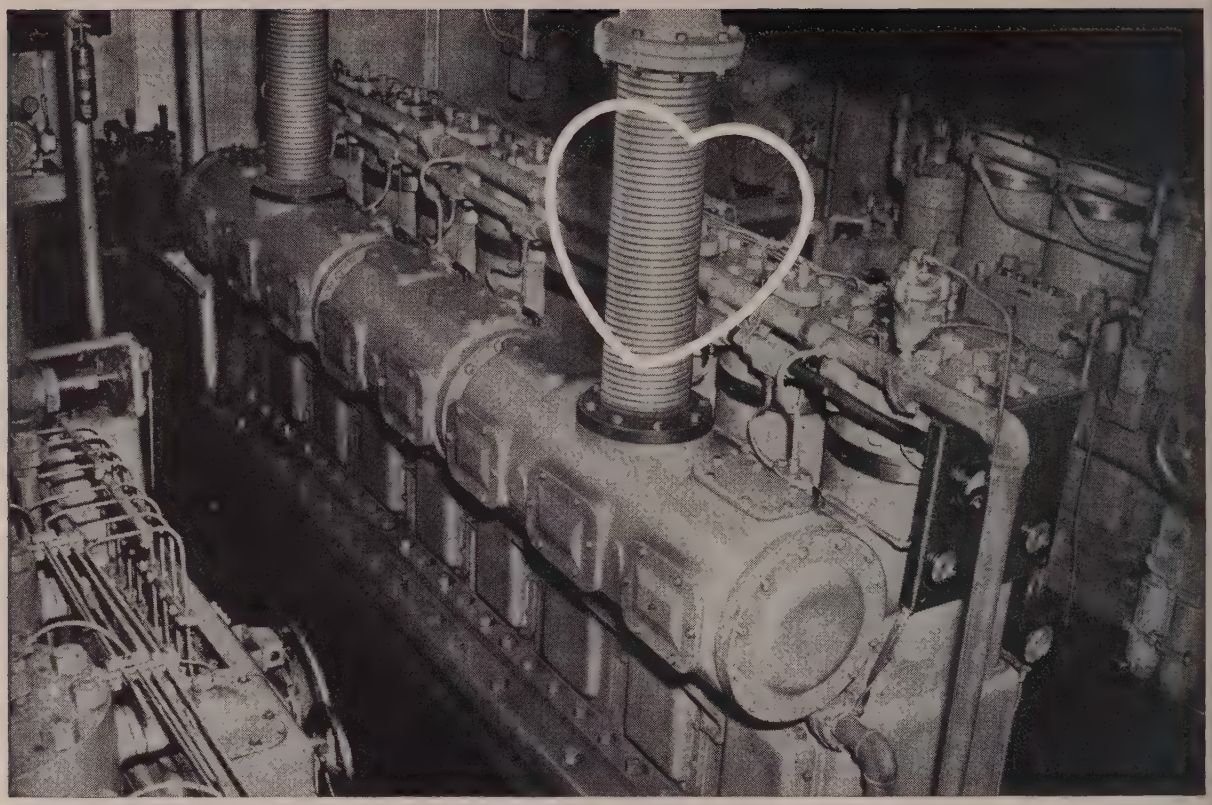
NEW ADDRESSES

Scovill Mfg. Co., Waterbury, Conn., moved its Cincinnati sales office and warehouse to 2330 Glendale Milford Rd., Evendale, Cincinnati 15, O. G. B. Wood is district sales manager.

Palnut Co., maker of lock nuts and fasteners, moved to its new plant on Glen road, Mountainside, N. J. Capacity of the plant facilities is double those formerly occupied in Irvington, N. J.

Parker Rust Proof Co., Detroit, moved its district sales and service office to 2875 N. Lincoln Ave., Chicago 45, Ill.


J&L Scrapless Nut Wire
Manufactured under quality controls which give you a wire with that delicate balance of characteristics so necessary to obtain the utmost in nut forming performance plus efficient tapping.
It's tops in quality—competitive in price.
J&L STEEL
Jones & Laughlin
STEEL CORPORATION — Pittsburgh



GIVES HORSEPOWER THE *P-U-R-R* OF A KITTEN

Flexible tubing reduces Diesel vibrations... Absorbs thermal expansion

Ever been around while a smoothly-running Diesel warmed up . . . and then, in a few minutes, began a series of vibrations? It's a condition often traced to the type of piping used on air intake and exhaust lines.

Such vibrations can be prevented . . . or cured . . . with Penflex four-wall interlocked tubing, which is flexible enough to absorb the vibration . . . tight enough to prevent any leakage of air and gases. It has other important features, too . . . it "gives"—instead of breaking with thermal expansion.

Afloat or ashore, Penflex tubing finds many applications on Diesel engines . . . on exhausts and air intakes . . . fuel oil and starting air lines . . . lubricating oil and water circulating lines . . . as a partial listing.

Penflex makes a complete line of four-wall, interlocking and seamless welded corrugated tubing, including braided-wire or rubber covered types . . . ⅛" to 24" I.D., in materials suited to various conditions.

"Flexineering," the science of selecting the tubing of the right size, weight, type and construction for these numerous applications, will be explained to you by Penflex engineers. Or you will find our "Flexineering" booklet both helpful and interesting. Send for your copy today.

Pennsylvania Flexible Metallic Tubing Company, Inc., 7219 Powers Lane, Philadelphia 42, Penna. • *Branch Sales Offices:* Boston New York • Chicago • Houston • Cleveland and Distributors in Principal Cities

flexineering by

PENFLEX

HEART OF INDUSTRY'S LIFELINES

FLEXIBLE TUBING, AUTOMATIC BARREL FILLERS, PNEUMATIC RIVET PASSERS, ACCESSORIES AND FITTINGS

STEEL

March 5, 1956

Technical Outlook

INSTRUMENT FOR METALS—Electro Metallurgical Co. has installed a nuclear magnetic resonance spectrometer at its Niagara Falls, N. Y., research laboratories for use in studying metal structures. The company says it believes it is the first industrial research organization to employ this type of equipment in metallurgical research.

IN. PLUS FT—Adding machines can deal with feet and inches as easily as tens and twenties, but you have to order them that way. A structural steel firm has one with a wide carriage; the keyboard is arranged in feet, inches and sixteenths of an inch: 10 in. plus 3 in. and presto—the tape shows 1 ft 1 in.

CHEAPER TV TUBES—Disc cathodes for narrow neck television tubes will be shown for the first time by Superior Tube Co. at the Radio Engineering Show (New York, Mar. 19-22). Says Superior: The new cathodes will make it cheaper to make television tubes because they allow a narrower neck, reducing the size of the deflection yoke.

DESIGN BY SURVEY—Design of the new 2000-ton forging press at Allegheny Ludlum Steel Corp.'s Dunkirk Works is the result of a survey of press facilities both here and abroad. It is of the inverted type, and has extensive automatic controls. Auxiliary equipment is designed for fast, economical handling of high alloy steels.

SEARCH FOR STRENGTH—Three studies for higher strength in metals are about to begin at Case Institute of Technology, Cleveland. For Wright Air Development Center: A basic study of ultra-high strength aircraft steels to determine ways of increasing their strength and safety. A second study for the Air Force to determine ways of increasing mechanical performance characteristics of titanium alloys containing normal amounts of impurities. For the Army Ordnance Corps: A search for new alloys of titanium and vanadium that can be processed to strengths approaching those of alloy steels, while retaining light weight and corrosion resistance. For the three: $93,000.

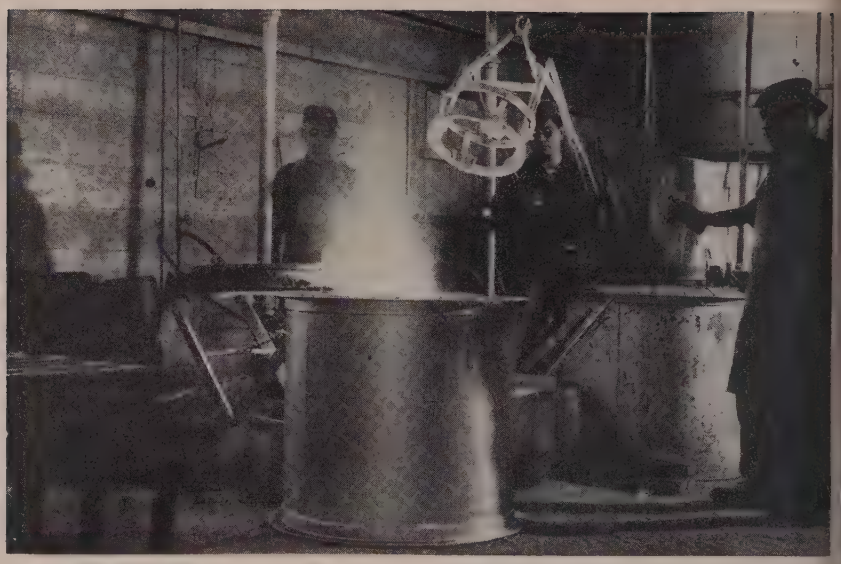
SEAL OF APPROVAL—Society of the Plastics Industry Inc. and the National Sanitation Foundation are going to put an official O.K. on plastic pipe for carrying drinking water. The foundation will inspect manufacturing plants, raw materials and finished pipe before permitting use of the seal of approval.

MATERIALS HOLD KEY—"The theory of nuclear power generation is no longer a bottleneck in making low-cost atomic power," says Stanley B. Roboff, manager of industrial co-ordination for Sylvania Electric's Atomic Energy Division. He told the AIME meeting in New York on Feb. 22: "Materials are our prime bottleneck. Progress in nuclear power plants will be only as fast as we can develop better materials for use in them."

URANIUM A-PLENTY—In another nuclear note sounded at the AIME meeting, Jesse C. Johnson, director of AEC's division of raw materials, said the free world's known uranium reserves have increased to a point where "we no longer see a problem in supplying the uranium requirements of the projected military and power programs." The U. S. and Canada soon will be turning out more uranium than was expected from the entire free world a few years ago, he reported. The uranium industry is almost a $500 million a year business now.

talworking Outlook—p. 45 Market Outlook—p. 139

151 uses for . . .



Bronze-melting furnace (foreground) was given a single coat of silicone-aluminum paint six months ago. The other furnace was recoated with organic paints several times during the same period

Silicones in Metalworking

EXPOSE a straight silicone paint to surface temperatures of 650° F for 10 hours a day and it remains in good condition almost indefinitely. Good, high-temperature organic paints soon blister and peel.

That has been the experience of maintenance men at Saginaw Bearing Co., Saginaw, Mich., in testing various paints on their bronze-melting furnaces.

After wire brushing a furnace to bare metal, they applied a single coat of silicone-aluminum paint. Cured in service, the coating was still in near-perfect condition six months later, when the above photograph was taken. Compare its appearance with that of a

Silicones at Work

DESIGN

PRODUCT FINISHES

Fluid

Coating to eliminate fingerprint corrosion on brass
Protective solution for heavily chromed fixtures
Silver tarnish inhibitor
Salt-spray-resistant film for white brass
Luster finish for zinc-plated, black-oxided parts of an electric iron handle

Compound

Rust preventive for steel measuring tape
Moisture sealant and protective film for shipboard microphone switches
Anti-food-staining compound for stainless steel walls in cooking ovens

Resinous

Black paint for automobile exhaust manifolds
White enamels on commercial cooking ranges and space heaters
Patching compound for ranges where porcelain has cracked off
Corrosion-resistant interior coating for lead-covered steel hot-water pipe

PRODUCT LUBRICANTS

Fluid

Impregnant for bronze bearings on butterfly valves
Extreme temperature lubricant for flexible shafting when mixed with molybdenum disulphide
Light-load gear train lubricant
Lubricant for small hydraulic piston and clylinder
Release agent for stripping lead from neoprene cable
Lubricant for steel and aluminum bearing surfaces in governor pilot assemblies

Compound

Antifreezing lube for exterior lock cylinders on autos
Low dielectric for solderless connectors between aluminum transformer leads and copper lead wire
Antiseizing compound for stainless steel couplings on stainless pipe threads
Combined with zinc chromate on bolt threads, washers and nuts in certain magnesium aircraft assemblies
Corrosion-resistant, thread-sealing compound for shells, bombs and rockets
Lubricant between phenolic laminates and stainless
Thread-gage lubricant
Corrosion inhibitor for magnesium threads engaged in steel threads
Lubricant and surfacing agent on magnesium window screens; prevents discoloration and sticking
Treatment on aluminum wells of food-serving equipment; prevents adhesion of burned-on food

Grease

Lubricant for oxygen gas valves

PRODUCT ADHESIVES

Compound

Pressure-sensitive tape to replace 48 in. of weld on a gas water heater
Pressure-sensitive tape for bonding aluminum heat-

Worker sprays welds on jet engine parts with silicone paint. After a 1-hour bake at 400°F, the silicone-based coating gives the necessary corrosion protection for 800°F operating temperatures

econd furnace (right) which was ecoated with organic paints sev- ral times during the same period.

Silicones—This illustrates one f the many new applications for ilicones. The accompanying list of ilicones at work was prepared in ooperation with Dow Corning Corp., Midland, Mich.

These manmade combinations of silicon, oxygen and organic groups have thermal stability, good release characteristics, are water repellant, antifoaming, nonadhesive and chemically inert. They are made in four basic forms—fluids (oils), compounds (greases), resins and rubbers—and can be formulated for a variety of combined properties.

Thermal Stability—Silicones remain stable up to 550° F, (or higher for shorter periods) yet retain their properties at temperatures as low as −120° F. This makes them particularly useful as electrical insulation, as rubber and rubber-coated parts in aircraft and as bearing lubricants in high-temperature, high-speed uses.

An example of the thermal stability of silicones can be found in silicone rubber-coated heater ducts for jet aircraft, which remain flexible despite hot air blasting through them and freezing temperatures outside.

High Temperatures—The materials used in many of the combustion chambers and burner supports which are made for J-35 jet engines by Solar Aircraft, Des Moines, Iowa, must remain unaffected by abnormally high temperatures. Aluminum-clad steel solves the problem satisfactorily, except for various fusion welds. These must be recoated with aluminum or a noncorrosive coating that will withstand up to 800° F.

Solar engineers spray or dip the welded part with two coats of Sicon, an aluminum paint formulated with Dow Corning silicone resins by Midland Industrial Fin-

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ing elements to steel shell of hot water heater
Pressure-sensitive adhesive coating on aluminum and copper sheets; maintains position during soldering

Resinous

High dielectric bond betwen a strain gage and aluminum sheet

Silicone Rubber

Bond between brass and molded graphite parts
High dielectric bond between water-cooled aluminum plates at edge of steel laminations in transformers

PRODUCTION

PARTING AGENTS, GENERAL

Fluid

Mold dressing for casting silver ingots
Parting agent for brass ingots and copper anodes
Release agent for centrifugally cast steel gears
Release agent for continuous cast aluminum; added to negative meniscus during casting
Mold dressing for casting welding rod
Release agent for casting antimony
Dressing for cast iron and water-cooled molds for brass and bronze ingots
Release agent for stainless steel ingots
Sealant for powdered metal parts; prevents plating solution from pentrating pores
Die lubricant for pressing tungsten powder
Release agent for casting magnesium and aluminum motor heads
Replacement for core oil on steel core-mold
Dressing for aluminum patterns to release sand cores containing phenolic binders
Parting agent in molding copper alloy

Compound

Mold dressing for water-cooled copper molds for sterling silver ingots
Release agent and antibuildup coating for Linotypes
Release agent for stretch-forming magnesium over a heated stainless steel form; used in the Lalli process

Grease

Release agent for metal flash on flash welder

Resinous

Treatment for wax and plastic patterns in lost-wax process
Permanent release coating for small laboratory permanent mold
Release coating for casting lead battery plates
Binder for powdered metal cores
Impregnant for graphite molds used in casting aluminum oxide

Silicone Rubber

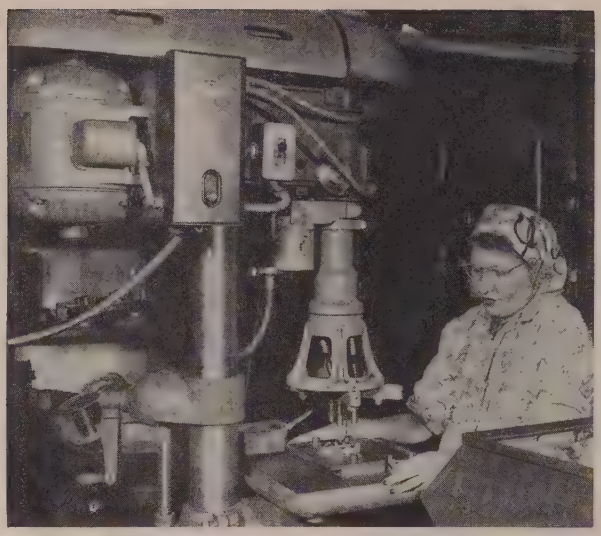
Seal around brass insert for casting aluminum
Gasket to aid removal of zinc billets from molds

PARTING AGENT, Diecasting

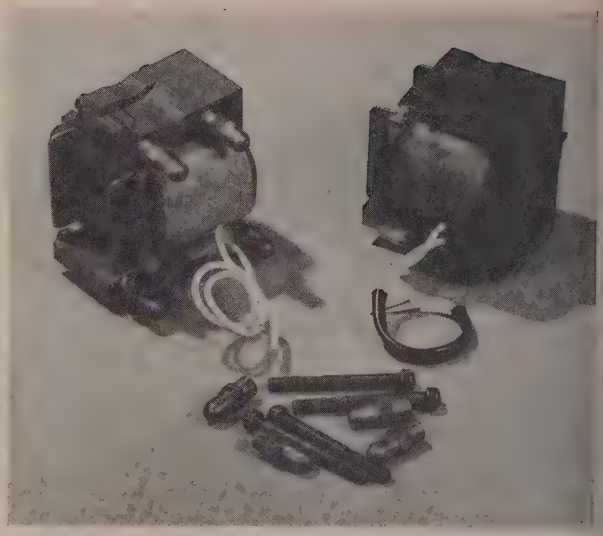
Mold lubricant for hard-to-release diecastings of zinc, aluminum, magnesium alloy, including parts which are later chrome plated

PARTING AGENT, Shell Molding

Release for steel, stainless steel and aluminum patterns in automatic and manually operated machines;



The 1-hp motor on this drill press overheated badly until it was rewound with Class-H, silicone insulation



A silicone release agent keeps holding bolts from bonding to the power unit when it is impregnated with resin

ishes, Waukegan, Ill. After a 1-hour bake at 400° F, the silicone-based coating provides the required protection.

High Speeds—Optimum cutting speed of the 6-32 taps in the 4-spindle drill press operated by the Allen-Stevens Corp., contract die-casters of Jamaica, Long Island, N. Y., is in the range of 1800 rpm. In an automatic feed machine, that spindle speed means about 1450 cycles, or 2900 full reverses in an hour.

The 1-hp, Class-A insulated drive motor overheated so badly it had to be shut down 2 hours out of every 8. To keep the machine operating 8 hours a day, spindle speed had to be reduced to 655 rpm, resulting in tap breakage costing an average of $10 a day.

Allen-Stevens rewound the motor with Class-H insulation made with silicones. Spindle speed was returned to the maximum, and tap breakage stopped. Production has tripled. Lost time has been eliminated.

Release Agent—Silicones, ap-

Silicones at Work

also used in Dietert process, in which vegetable oil is substituted for the phenolic resins used in conventional shell molding

WIRE-DRAWING LUBRICANT

Drawing lubricant for various wire metals, including aluminum and tantalum

GENERAL-PURPOSE ANTISTICKING

Fluid

Antioxidizing coating on the surface of molten solder in small tinning pots
Release agent on aluminum core boxes
Release agent for transite boxes to prevent adhesion of molding sands

Compound

Compound to prevent build up of gold lacquer on press used to punch tin can covers
Coating to prevent oxidation of welded seams
Compound to prevent hold-down bolts from baking in place during varnish-curing of coil lamination in reciprocating motor
Seal for hollow end of heating unit during electroplating

Resinous

Baked-on coating to prevent liquid solder from sticking to certain areas on copper-bus bar connectors
Baked-on coating for brass

FINISH AND FINISHING OPERATIONS

Fluid

Treated tissues for wiping glass shields on soldering equipment

Resinous

Heat-resistant finish for gasoline-torch-heated soldering irons
Heat-resistant finish for bronze-smelting furnaces
Heat-resistant finish for large core oven doors
Corrosion-resistant interior finish for steel hot air ducts
Corrosion-resistant finish on heat exchanger tubes

Silicone Rubber

Wipers to remove excess tin during tinning of copper wire
Wipers to remove heavy scum from tin and lead covered steel pipe after leaving hot flux bath
Rubber stamps to mark hot metal

ALUMINUM FOIL PROCESSING

Compound

Foam control in aluminum foil processing oil

Resinous

Adhesive to bond foil to core as it comes off the rolling mill
Adhesive to patch and splice foil prior to several hours annealing at 800° F

HIGH TEMPERATURE BATHS

Bath for annealing cadmium-plated spring steel
Bath to anneal collapsible aluminum tubes
Heat transfer bath for heat-treating aluminum pistons

Operators had to shut down these grinders 15 minutes out of every hour because of foaming coolant. A silicone antifoam emulsion eliminated the down time

plied as emulsion or solvent solutions, are especially effective as release agents on metal patterns in the shell molding process. Fluids and compounds are used as release agents in diecasting, investment casting, permanent mold casting and ingot pouring.

Another metalworking application: The power assemblies for portable sanders and jig saws made by Syncro Corp., Oxford, Mich., are impregnated with a polyester resin and baked out at 275° F. During impregnation and baking, they are held together by four special bolts, which are later removed. Frequently the bolts became bonded to the power unit assembly and removing them was difficult and costly. Scrap ran high.

A silicone release agent on the bolt solved the problem. Production increased 300 per cent, scrap loss dropped to zero.

Water Repellant—Silicone resins provide a water-repellant coating for masonry and concrete. The fluids form water-repellant films on wood, glass, rubber, ceramics and other solid surfaces.

Defoamers—Low surface tension is a characteristic property of the silicone fluids. This property makes them particularly effective in defoaming adhesives, synthetic rubber and lattices, caustic liquors and varnishes. Added to paints, silicones prevent pigment floating.

In a midwest auto parts plant, a silicone antifoam emulsion increases productive capacity by eliminating a serious foaming problem with the water and oil coolants used in heavy-duty grinders.

Recirculated to the working surface every 5 minutes, the coolants foamed so badly that the grinders were down 15 minutes of every hour while the foam was cleared away. A few ordinary foam in-

MAINTENANCE

IN-PLANT LUBRICATION

Fluid

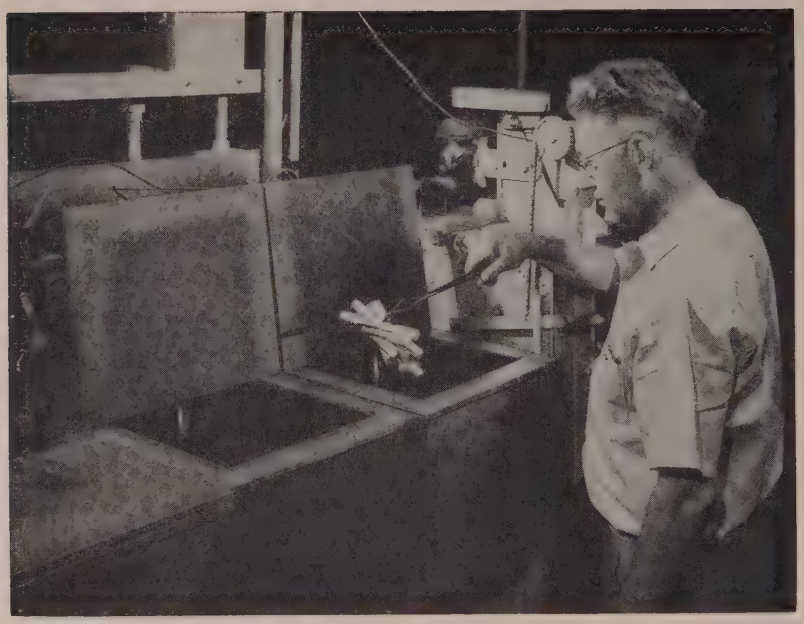
Additive in soldering flux; improves appearance on soldered joint
Impregnated cotton buffers to remove excess solder during can manufacture
Antiseize treatment for collets used in heat treatment of automotive valves
Additive in rolling oil lubricant; increases life of dies used to stamp aluminum pie plates
Lubricant for extruding aluminum
Packing impregnant for two bearings at the end of a soldering roll on solder pots
Rust preventive for hand tools and other metal parts with finely machined surfaces in storage
Lubricant for high-speed drilling of aluminum
Lubricant for bending aluminum tubing
Lubricant for diecasting machine plunger
Lubricants for conveyor chains subjected to Bonderizing bath at high temperatures

Compound

Brushed-on coating to prevent pressure tools from bonding to the metal part during "Metlbond" operation
Substitute for plaster of paris; prevents zinc from coating threads during galvanizing

Grease

Lubricant for: Steel wiper blades applying lacquer to steel stripping
Bearings of direct-connected pump over molten salt baths in austempering furnace
Ball bearings on cupola intake draft fan
Bronze camshaft bearing on carbon steel shaft in a turbine unit
Oven exhaust fan bearings
Bearings of smelting equipment
Conveyor bearings operating over electrolytic bath; unaffected by alkalies
Bearings of rolls used in tin plating
Bearings of cranes and cover-carriages working over soaking pits
Roller bearings on tin-dipping machines
Solder rolls
Ball bearings in beer can lithograph curing ovens
Ball bearings on continuous welding machine for steel drums
Solder box bearings
Roller bearings in pallets traveling through sintering ovens
Conveyor passing through nickel and chromium plating tanks
Conveyor carrying parts through an alkaline cleaning machine
Baking oven conveyors
Roller bearings for conveyor systems on an annealing furnace
Trolley wheels conveying sand molds into baking ovens
Motor bearings beneath annealing oven carts
Carts carrying steel castings into heat-treating furnaces
Flexible shafts of small grinders
Bearing surface of a vertical arm which removes red-hot crankshafts from heating oven prior to forging
Shafts of ladles carrying molten metal



Used for accelerated life testing at 300 to 400°F, 5-gallon baths of silicone fluid have been held at operating temperatures for more than three years

hibitors were effective, but they also reduced the coolant's efficiency.

Four years ago, the partsmaker tried a silicone antifoaming agent in the coolant. Foam vanished. Only ¾-cupful kills foam in the 300-gallon tanks in Mattison grinders. A pint defoams 500 gallons of coolant in the reservoirs of Blanchard tappet finishing grinders.

Nonadhesive — Silicones refuse to stick to things. This property makes the rubbers useful in such applications as sleeves for rolls of machines processing pressure-sensitive tapes or applying adhesives.

While they normally are nonadhesive, the silicones can be formulated to form tough, flexible bonds for mating rubber to metal, glass, plastics and ceramics. Pressure-sensitive tapes made with silicone compounds can be applied at temperatures ranging from −70 to +475° F and retain good adhesive strength after long exposure to these temperatures.

Inert—These versatile chemicals can be extremely lazy. Silicones refuse to react with most materials. This enables them to resist decomposition and weathering. They produce no corrosive effects on metals.

The long life of the silicones has been demonstrated at Dow Chemical Co. Used in the metallurgical laboratories for accelerated life testing of magnesium alloys at temperatures ranging from 300 to 400° F, 5-gallon baths of silicone fluid have been held at operating temperature constantly for more than three years.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

Silicones at Work

Silicone Rubber

Plug for flexible metal tubing during soldering
Bonded to hot metal dies; serves as a resilient tip for bonding gold leaf to plastic

ELECTRICAL INSULATION

Insulation on variety of electric motors: Automatic nut tighteners, stamping presses, reamers, shakers, automatic and rapid reversing lathes, charging hoists, stripper pit cranes, pumps handling caustic solutions, wire-drawing equipment, automatic thread cutters, hand and swing grinders, coilers, core oven and furnace draft fans and conveyors
Impregnant for induction coil used for heating up ingots prior to forging
Components of lining cements in furnaces

GENERAL-PURPOSE SEALS

Fluid

Pot seal fluid; enables bronze bellows to be substituted for stainless steel bellows in measuring instruments designed to withstand corrosive vapors and gases

Compound

Impregnated packing; increases life of pump handling corrosive gases
High vacuum seals in a titanium refining process

Resinous

Bond for asbestos gaskets used in stacks venting hot air and gases

Silicone Rubber

Coated cloth to seal top of an electric furnace
Extruded strips to seal dump boxes in shell-molding machines
Coated cloth curtain for heat-treating furnaces
Sheet stock: serves as flexible seal for heat exchanger ductwork on open-hearth and blast furnaces

FOAM CONTROL

Fluid

Coolants used in Blanchard and Mattison grinders
Cutting oil for lathes
Penetrating oil used for soaking metal parts
Sulphuric acid solution in pickling baths

Compound

Hot caustic solution used for reclaiming tin
Caustic solution used to clean steel drums
Nickel plating solution

MISCELLANEOUS

Fluid

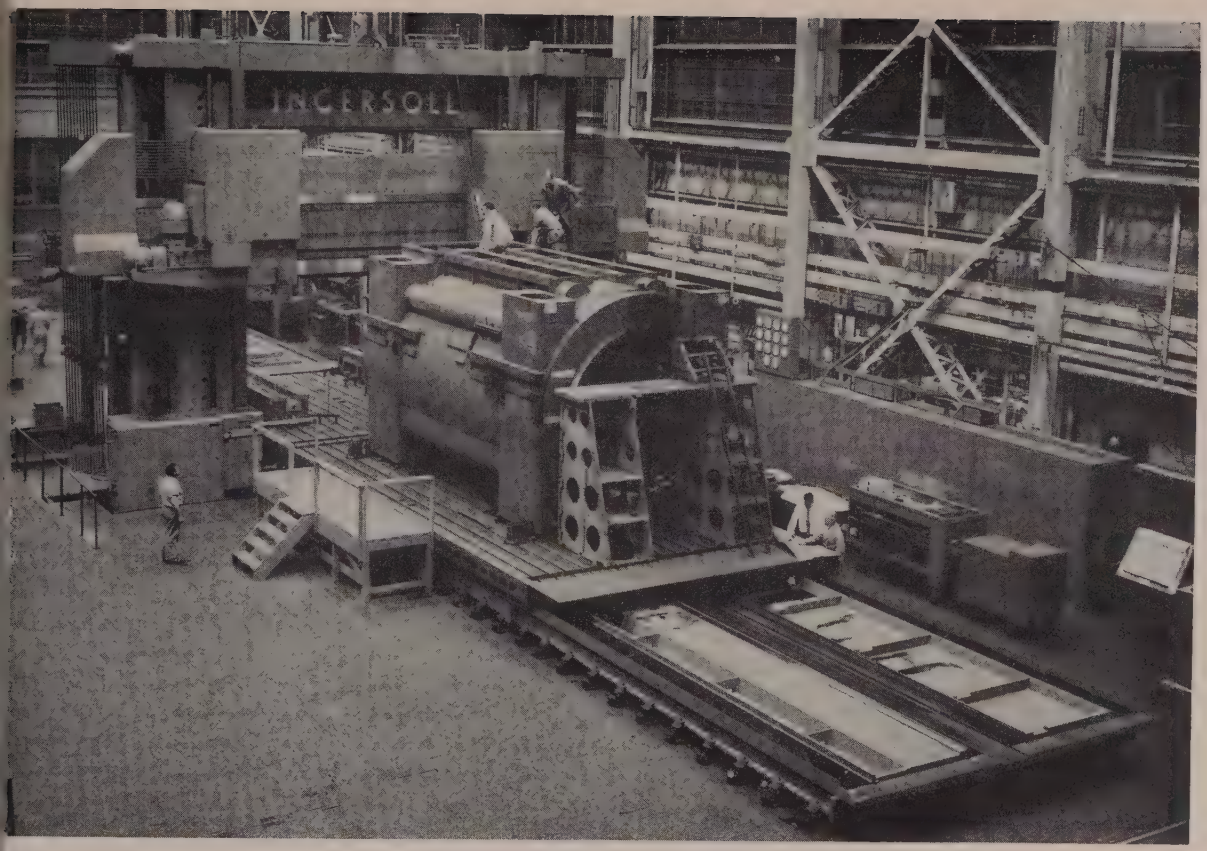
Shock absorber time delay assembly; unit used to stop steel billets as they slide along conveyors
Liquid springs one-tenth as heavy as comparable steel coil springs
Impregnant for powdered-iron pulley to eliminate dusting on a rubber belt
High viscosity fluid used on screws in certain aircraft assemblies to prevent them from shaking loose

Compound

Used with a thickness gage; transmits mechanical vibrations and holds gage in place

Silicone Rubber

Coated cloth for machine covers



owering high above the floor at Ingersoll Milling Machine Co.'s plant, the 18½-ft djustable-rail milling machine takes a cut on a 72-ton stator frame

Giant with a Feather Touch

ll of the machine's 575 hp are controlled from this pendant. Milling utters are carbide

HE LARGEST milling machine n the world. That's the claim of xecutives at General Electric and ngersoll Milling Machine Co. who igned the order for it on Apr. 29, 1954. Some 6000 engineering man-hours later the adjustable-rail machine is ready on schedule.

Despite its size, the machine will have to work to close tolerances. It will mill the joint surface of low pressure hoods to within 0.003-in. flat over the 16-ft surface.

The million-dollar giant ($500,000 more goes into tooling, foundation and installation) weighs 1¼ million pounds. It's now undergoing run-in in the high (43 ft under the crane hook) assembly bay at Ingersoll's Rockford, Ill., plant. The machine stands 35 ft high.

Capacity—Big enough to clear a box car with ease, the mill will handle parts 18 ft wide, 16½ ft high and more than 50 ft long. Two tables, 22 and 30 ft long, travel on the 112-ft bedways. They'll make it possible to have one part in the machine while another is being loaded and set up. The machine has two vertical and two horizontal heads. Each has its own 100-hp drive.

GE will use the machine in its Schenectady, N. Y., plant to mill huge steam turbine and generator parts. Replacing several older machines, it will save floor space and will reduce inventory of huge workpieces by getting them through the shop without delay. Machining parts in only two setups, the unit is expected to reduce the crane lifts by 50 per cent.

Delivery—GE will use the giant the middle of this year. It will be disassembled in Rockford and shipped on 17 freight cars.

It is designed around current GE production requirements. Anticipating future needs, however, both GE and Ingersoll engineers worked in features and capacity for jobs to come.

Three conveyors climb out of the floor carrying scrap toward the control tower. The two larger units, built by Planet Corp., Lansing, Mich., dump their loads into automatic balers. The third, built by Mechanical Handling Systems Inc., Detroit, carries smaller pieces and deposits into a hopper for direct loading into gondola cars

Scrap Gets Heave Ho

A PUSHBUTTON conveyor system disposes of more than 4500 tons of steel scrap a month at Chevrolet's new stamping and frame plant near Flint, Mich.

Running beneath the plant floor, more than a mile of conveyors collect scrap which slides down chutes from trim presses and other equipment in the stamping section.

Large scrap is dumped into Logemann balers and compressed into 200-lb bundles. Smaller scrap is loaded into gondola cars by an electromagnet.

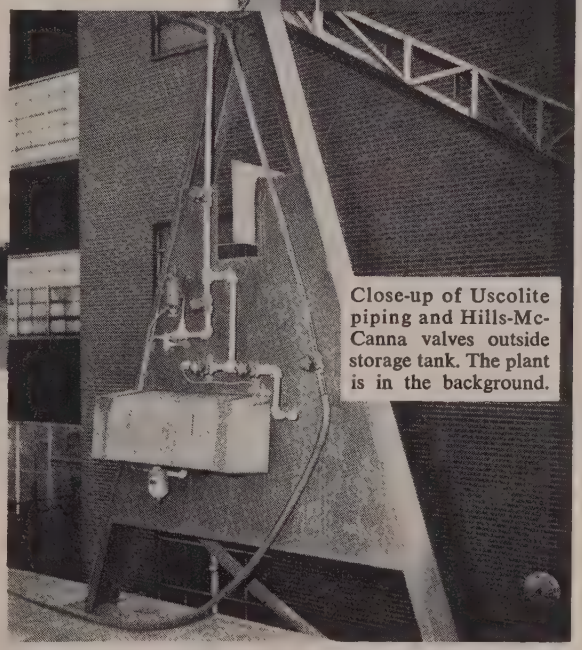
The monthly scrap volume fills some 80 rail cars with bales and ten with smaller clippings. The scrap is melted down at the Chevrolet gray iron foundry in nearby Saginaw, or sold to steel mills and other buyers.

In the control tower (above), the operator views the mounting piles of scrap deposited at the balers by means of strategically placed mirrors. When the accumulation is sufficient at any of the three machines, he pushes a button and the scrap is compressed into a 200-lb bundle in about 27 seconds

The compressed bundles (left) are carried by a long-necked conveyor to gondola cars which can be moved into position by another pushbutton in the control tower

Uscolite Pipe helps save thousands of dollars a year in an acid-handling system

U.S. Uscolite Piping carrying hydrochloric acid from storage tank into plant.



Close-up of Uscolite piping and Hills-McCanna valves outside storage tank. The plant is in the background.

. large Eastern manufacturer of lighting and signaling ystems uses 300 feet of Uscolite® plastic pipe to carry ydrochloric acid from storage tanks outside the plant cross an areaway, and then through various production epartments to final use in the plating room. Previously, arboys of acid had been used, because the plant had o facilities to store acid in bulk. But by installing a new cid-handling system, using U.S. Uscolite piping and ttings, the plant saves thousands of dollars a year—they ow *buy and store in bulk*. Additional thousands are aved by reduced handling costs.

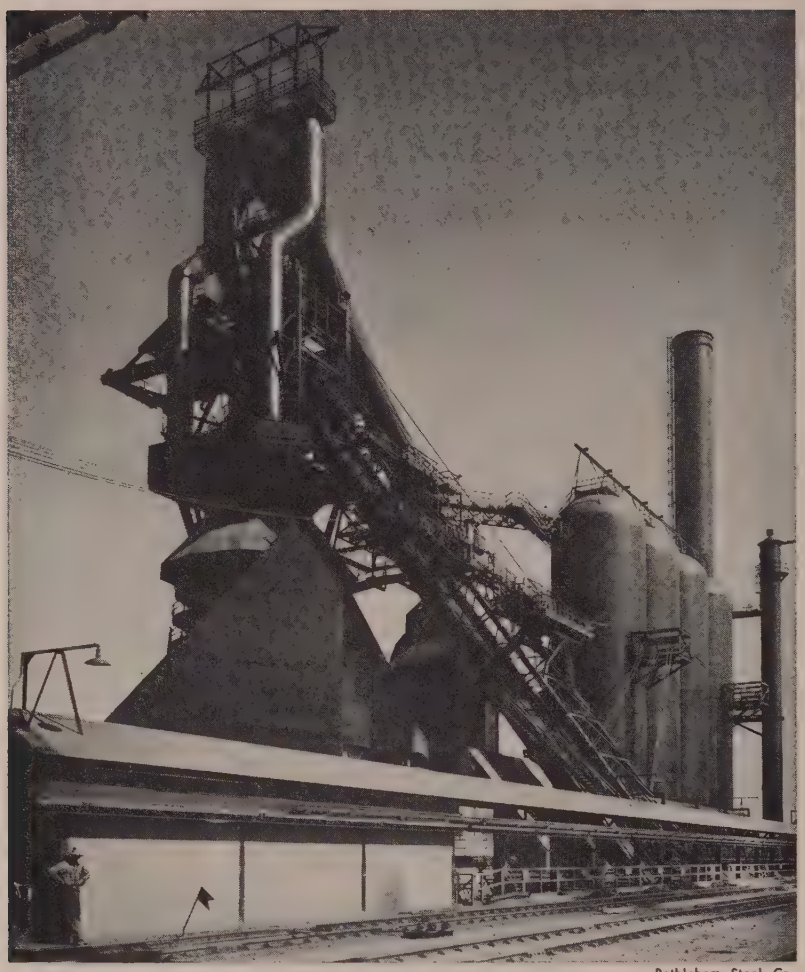
The plant engineer is pleased because Uscolite's unusual mechanical strength enables it to be left exposed in any weather, and to be run overhead through various parts of the plant without fear of damage to men or machines. Hills-McCanna Uscolite valves are used in the piping assembly.

Made by United States Rubber Company, Uscolite is light in weight with high impact strength. It is solving acid and corrosion problems in every industry. The piping can be easily threaded and installed with conventional tools. For replacements or a completely new piping system, get in touch with any of our 28 strategically located District Sales Offices, or contact us at Rockefeller Center, New York 20, N. Y.

Uscolite pipe and fittings are made in the broadest and largest line of stock sizes on the market.

Mechanical Goods Division

United States Rubber



Bethlehem Steel Co

High sulphur coke may be an asset when . . .

Carbide Brings the Sulphur Down

IN THE HIGH temperatures of the electric furnace, calcium carbide can be used as a desulphurizer. The reaction presumably goes $CaC_2 + S = CaS + 2C$. A new desulphurizing process, carried out in the ladle, makes it possible to use the reaction at the lower temperatures of blast furnace iron.

The trick is to use an inert carrier gas to inject the carbide under the slag in the ladle. Air Reduction Co., which developed the process, has tested it on 40,000 tons of blast furnace iron and open-hearth steel over the last year and a half. Tentative conclusion: The process is reliable and practical, especially with melts having a high sulphur content before treatment.

Progress Report—J. M. Crockett, manager of the metallurgical section, Air Reduction Sales Co., described the process at the recent Pittsburgh meeting of the Eastern States Blast Furnace & Coke Oven Association. Enough data have been gathered on it, he said, to make possible estimates of costs. Included is the possibility of using furnace burdens with higher sulphur content.

The process requires relatively simple equipment: A nitrogen gas supply (cylinders), a unit to mix gas and carbide and control rate of flow (the feeder), a rubber conveying hose and an injector to carry gas and carbide below the surface of the molten iron. The injector is a ½-in. ID x 2 in. OD graphite tube. A simple hoist is all that is needed to raise and lower the tube in the ladle.

How Much? — Theoretically, it should take about 2½-lb of carbide to remove 1 lb of sulphur, but in tests the process operated at from 6 to 23 per cent of this level. On the average, it took about 8 lb of carbide to bring down the sulphur in a ton of iron to about half its level before treatment. The process was most efficient when the starting sulphur was over 0.030 per cent.

The reaction does not affect the chemistry of iron except for the sulphur removal. There is no nitrogen pickup from the carrier gas and no sulphur reversion after the injection tube is removed. The slag formed is dry and easily skimmed, and does not react with ladle refractories.

Fitting In—How best to integrate the process will depend on plant layouts. Experimental setups have been installed on a catwalk over ladle car tracks and on a ladle crane. The equipment is small enough to be made portable.

It can be operated by unskilled labor, once the sulphur level has been determined. Carbide injected can be a measured quantity, or can be regulated by injection time. Time is important because the reaction lowers the temperature of the iron.

The process has many variables: Ratio of gas to carbide, injection rate, immersion depth of the tube, size and type of ladle, temperature of metal, sulphur level before injection and the level required were mentioned. How they affect the operating picture, and the economic side of the process will be discussed at the April meeting of the AIME in Cincinnati.

Stove Control—A look at automatic hot blast stove control in Germany by Hermann Jansen, technical director of Zimmermann & Jansen GmbH in the Rhineland.

7 of the 8 open hearths in No. 2 shop at Indiana Harbor have Ramset bottoms

YOUNGSTOWN Sheet and Tube is making steel on 7 Ramset bottoms in its No. 2 open hearth shop at the Indiana Harbor Works.

The majority of bottoms installed in new open hearth shops during the past several years are of rammed construction. And of these hearths, Ramset installations number more than half again as many as any other magnesia ramming mix.

Basic Refractories pioneered the development of rammed hearth techniques several years before World War II. These methods have been continuously refined by the practical steelmakers who form the sales and service staff of Basic Refractories. As a result Ramset and Basic's installation techniques have become accepted as standard throughout the industry.

When deciding upon Ramset steelmakers select a proven refractory and proven installation methods, thus insuring the most dependable open hearth bottom construction available.

BASIC REFRACTORIES INCORPORATED 845 HANNA BUILDING, CLEVELAND 15, OHIO

REFRACTORIES ENGINEERING AND SUPPLIES, LTD.— EXCLUSIVE CANADIAN AGENTS

revealed wide divergence from American practice. In at least one German installation, 15 stoves for five blast furnaces are controlled by one man from a central panel, and smaller automatic installations are numerous.

Valves are electrically operated and interlocked so that stove changing is a matter of pushing a button. Change-over times are as short as 45 seconds. If power fails, 4-minute manual change-over is possible.

High efficiency burners developed by Zimmermann & Jansen take advantage of the low heat losses that accompany fast change-over. Some delegates were frankly skeptical of the practicality of shifting existing American installations to full automatic operation. "Ignoring the obviously high installation cost," one remarked, "what do we do with the displaced stove tenders?"

More Air — A proposal that stands a better chance of immediate adoption was: Fire the stoves all the way with 50-per-cent excess air. It was presented by R. Milton Deaner, service engineer of Arthur G. McKee & Co.

With present methods of firing, he pointed out, the stove domes soon reach their top practical limit of 2100°F. Then it is necessary to back on and off on the heat to ride this maximum, while the heat slowly soaks into the lower checkers. By blowing excess air from the start, the stove heats gradually throughout, reaching the 2100°F limit only at the end of the cycle.

More even heating, increased effective heat storage capacity of the stove, less plastic flow and thermal shock while providing a 1400°F straight-line blast temperature were advantages cited. It was pointed out that the excess air would raise gas exit temperatures, making a problem in some older stoves, and that larger capacity blowers might be required.

On the coke oven side of the meeting, oven operators and coal men took a hard look at coal chemical business lost to petrochemicals. The concensus: Coke can win back lost chemical markets through methods such as light oil hydrogenation, but it's going to take equipment and plenty of money.

Computers Move to Production

One aircraft company already is using them to solve its problems of scheduling, inventory and parts requirements

ELECTRONIC computers soon may be calling cadence for production machinery. Many of the big computers in industry were bought to solve engineering and scientific problems, but management is taking advantage of them to unscramble complex production puzzles.

C. R. DeCarlo, director of IBM's applied science division, sees computers as a "natural answer for problems of production, inventory and other industrial operations."

Scheduling—At a meeting of the American Society of Mechanical Engineers, Dr. DeCarlo cited the experience of an aircraft company using a computer for "production scheduling and control of shop orders." The system treats engineering, manufacturing, inventory and planning information simultaneously.

After the company gets a contract for a new model, management gets up a master schedule, stating the number of ships to be built, rates of production and the number of days a specified rate is to be effective.

Timetable—The computer devours these data and comes up with a base schedule that shows, by shop calendar date, the exact day each ship is due at a given station or position on the production line.

If manufacturing schedules accelerate or slow down, the base schedule is altered accordingly. After the base schedule is figured, ships of one contract are grouped into lots and all fabrication and assembly parts are scheduled to the first ship of the lot.

One File—All information relating to the schedule (engineering description, spare parts requirements, cost, etc.) is written as one main tape file. A file, prepared every week, reflects all changes in the main parts and schedule file. This one contains engineering and manufacturing changes, as well as inventory information.

These two files are worked together to get a new main tape. Engineering and manufacturing changes are entered in the new main file. Part usage by assembly and plane is extended and summarized by lot and contracts. Net quantities are computed for each lot in each contract. Part orders are checked, and if a need for a part is determined, it is scheduled and recorded.

The machine will continue to schedule quantities for each lot until a lot is reached that doesn't require new shop orders. Finally, orders are written for replacement parts.

Dr. DeCarlo concludes that "perhaps the most important concept . . . lies in the consolidation of many files (all basically related to the part number) into one file."

He says: "There are several areas of dissatisfaction in production and inventory management which have defied the efforts of man to exercise rational control over them. The electronic computer . . . has generated a great hope . . . in this area."

Trouble Spot

Improper mounting is the culprit behind about one-third of all grinding wheel failures. That's the warning from Norton Co., Worcester, Mass. Ralph N. S. Merritt, Norton product safety engineer, points out that this can cover a multitude of sins, from using the wrong arbor to running the wheel beyond its rated speed.

"Here's why we use Harvey Aluminum extrusions in our industrial slides"

Once the manufacturer of this electronic drawer slide machined the three parts from solid bar stock. Now, he uses three *custom designed* Aluminum Extrusions supplied by Harvey Aluminum. They require no machining and need only cutting to length and drilling before final assembly. Production time, scrap loss, handling and over-all costs were all sharply reduced . . . and the product is better, in the bargain. Countless other designs have been simplified and made more profitable by Harvey Aluminum Extrusions. Learn how they can help your own product; send *today* for our brochure, "Aluminum Extrusions."

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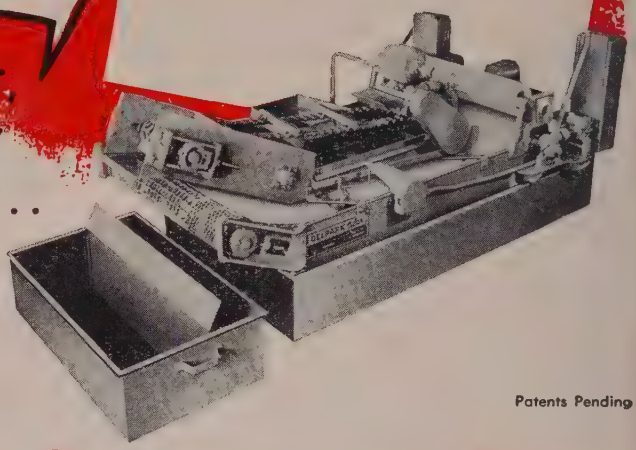

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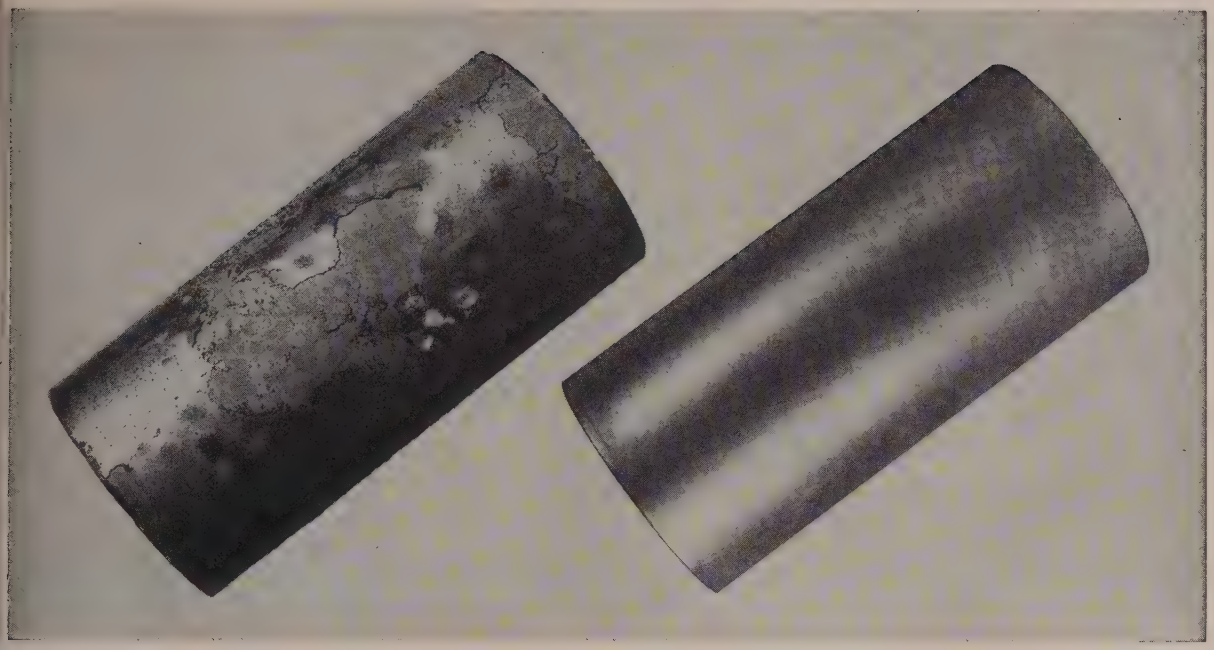


Scale-Free Heating in a Direct-Fired Furnace

By HORACE DREVER
President
Drever Co.
Bethayres, Pa.

Typical Performance

Weight of billet	15 lb
Throughput	72 an hour
Weight	1080 lb per hr
Temperature of stock	2156°F
Average gas rate	2400 cfh
Gas quality	450 Btu per cu ft

Note: Billets are of mild steel. They were heated in a hearth area of 12 sq ft at a furnace temperature of 2192° F

THE STEEL billets are of identical quality and size.

The one at left was charged clean into a direct-fired gas furnace, raised to 2340°F in about 20 minutes, held for 30 minutes at temperature and cooled in a dry nitrogen atmosphere. The scale formation was about 0.117 lb per sq ft of surface area.

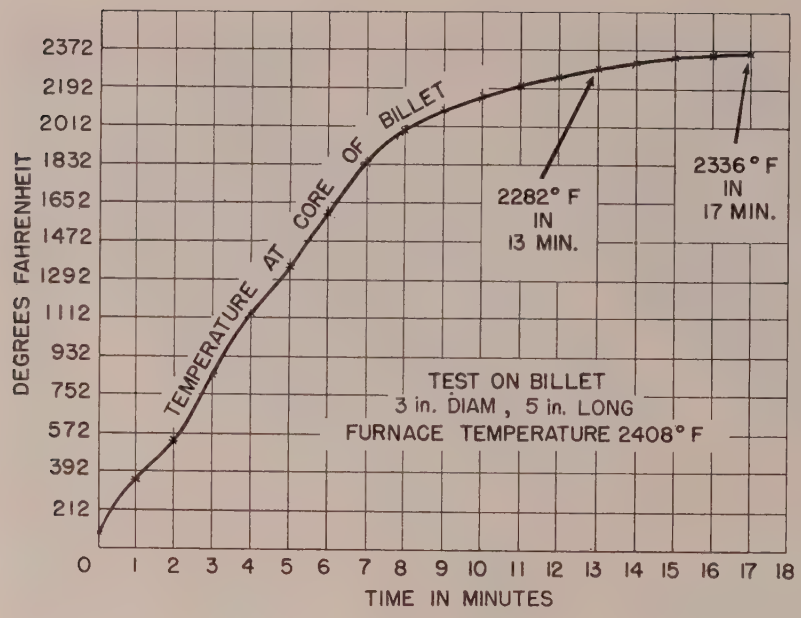
The billet at right was heated to the same temperature in an Equiverse furnace in 17 minutes, held for 30 minutes and cooled in a dry nitrogen atmosphere. The metal loss was nil.

New System — The Equiverse furnace, which was developed in England, uses a new controlled atmosphere technique for scale-free heating of steel. The burners which do the heating also create a scale-free atmosphere when operating up to 2350°F.

The principle of this system is the operation of burners at about 50 per cent of the air required for complete combustion; this air is preheated to obtain the high temperatures required. The products of combustion, which form the nonscaling atmosphere, are high in hydrogen and carbon monoxide. The other 50 per cent of air required for combustion is added in a regenerator which is used to preheat the primary combustion air.

Scale Formation—In a direct-fired furnace, scale formation occurs in atmospheres with up to about 12-per-cent CO after partial combustion of the fuel. Above 12 per cent, scale formation drops rapidly; at 16.5 per cent it is practically zero. Forging temperatures have been maintained satisfactorily in the Equiverse furnace with a CO content of between 12 and 16.5 per cent.

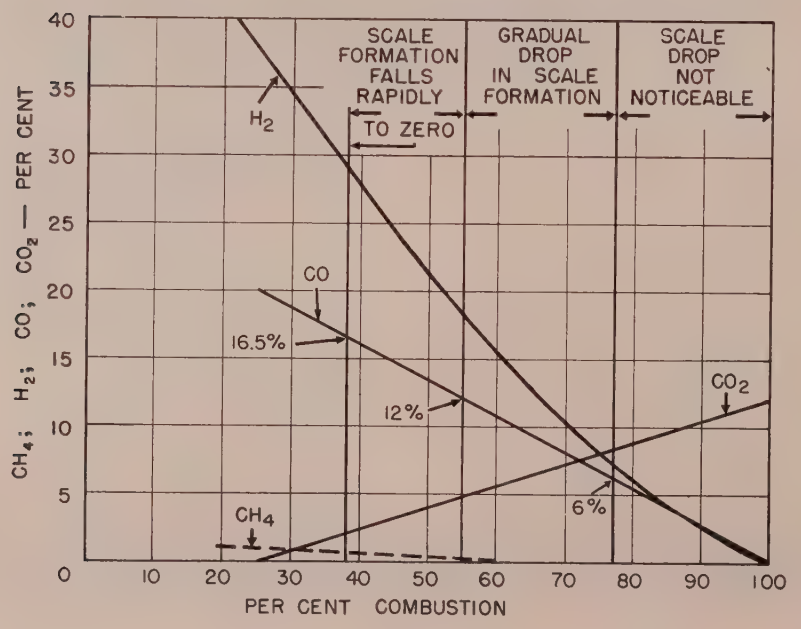
Regenerators — The basis of scale-free heating is in the use of two metallic matrix regenerators located above the furnace. The furnace is fired alternately from the burners on one side and then from the opposite side, the cycling



taking place every 30 to 60 seconds. The same cycling directs the products of combustion first through one regenerator and then the other.

The design of the regenerators makes them highly efficient heat exchangers. Both temperature and flow conditions are maintained automatically, insuring almost complete recovery of waste chemical and sensible heat, and the positive proportioning of combustion air between the burners and the regenerators. The regenerators reduce the stack temperature from a normal 2300 or 2400°F to about 600°F.

This new system of atmosphere control is not confined to batch production but may be applied to conventional continuous furnaces of the straight-through or rotary type.



Iron-Enamel Bonds

Role of oxygen in iron-enamel adherence has been evaluated in a series of tests

TO LEARN MORE about ceramic-to-metal bonding, the National Bureau of Standards conducted a series of experiments in which oxygen content of the furnace atmosphere was varied when a vitreous enamel containing different amounts of cobalt oxide was fired onto iron.

Results reveal that, for optimum adherence, any decrease of oxygen in the furnace atmosphere requires a corresponding increase in the amount of cobalt oxide. Enamels containing 3.2 per cent or more develop a weak but definite bond where furnace oxygen is as low as 0.02 mole per cent, but when smaller amounts are used, more oxygen is needed for good bonding.

Oxygen Supplier—A coating containing 0.4 per cent cobalt oxide developed its best adherence at an oxygen content of 20 mole per cent (about that of air). Enamels with more cobalt reached their peak adherence at about 5 mole per cent of oxygen.

Enamels with larger amounts of adherence oxides do not require as much oxygen in the atmosphere as those with smaller amounts; this indicates that oxygen can be supplied by the enamel itself. The cobalt oxide in some way supplies, or facilitates the supply of some of the oxygen, since the amount of the oxide is the only difference in the coatings.

Roughness—Metallographic sections of specimens showed that the adherence increased with increasing roughness of interface between enamel and iron. The roughing of the enamel occurs during firing by what is believed to be a galvanic corrosion mechanism. Reducible oxides in the coating can furnish the necessary oxygen.

There is evidence, however, which indicates that interface roughness does not completely account for adherence: Poor adherence has been observed on rough interfaces. Also, fairly good adherence has been obtained on alloys without surface roughening.

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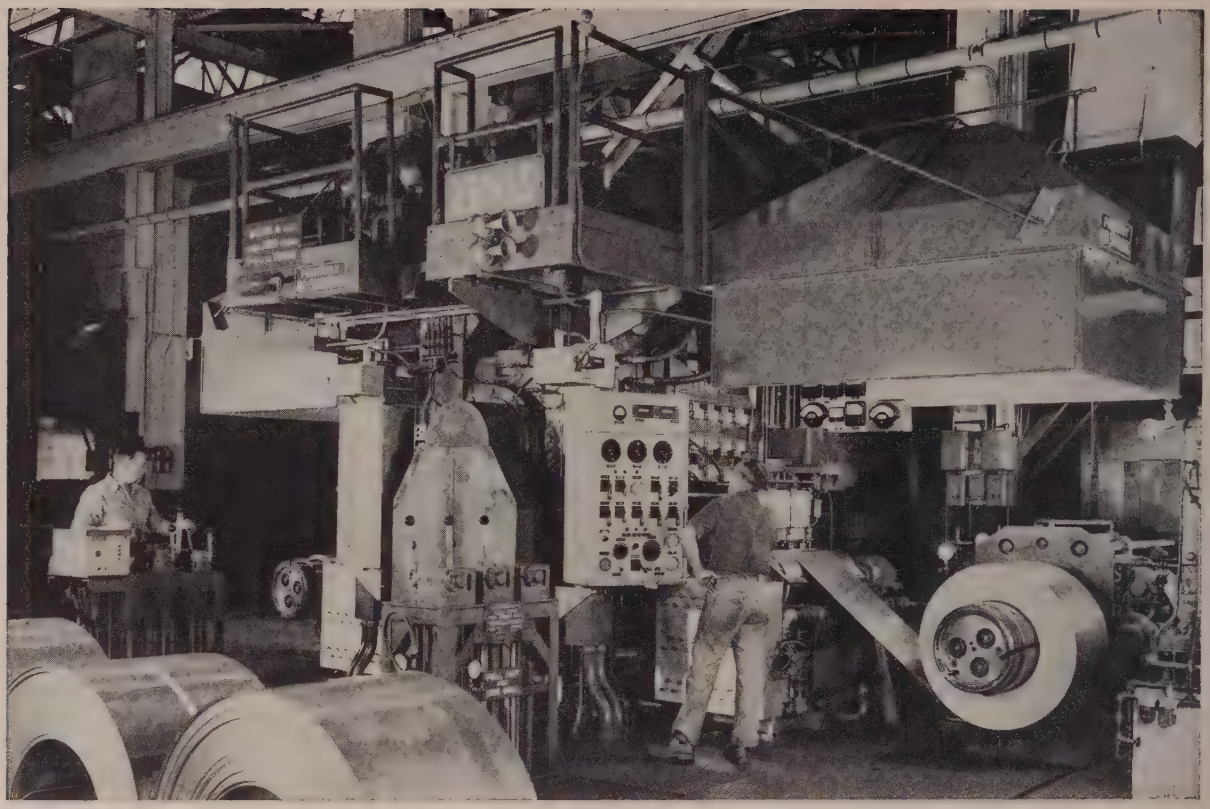


Cold rolling mills like this one promise a . . .

Boost for Nonferrous Strip Output

TWO, NEW high-speed rolling mills at its Torrington, Conn., plant are helping American Brass Co. keep pace with the growing demand for aluminum and copper-base alloy strip.

They are 10 x 29 x 36-in., four-high, reversing cold mills built by Lewis Machinery Division of Blaw-Knox Co., Pittsburgh.

Statistics — Rolling strip at speeds ranging from 400 to 1200 fpm, the 36-in. mills can cold reduce 0.125-in. thick aluminum alloy to 0.010-in., with intermediate anneals if needed.

Inner diameter of the finished coils is 20 in.; maximum outer diameter is 49 in. The coils are 14 to 32½-in. wide and weigh about 4800 lb.

Drive—A 600-hp motor drives each mill. One mill has a 75-hp motor and a 150-hp motor mounted in tandem with an interposing clutch driving each reel. Dual motors on the winders give the operator greater sensitivity in controlling the tension on the strip going through the mill. The other mill has a 250-hp motor on each reel.

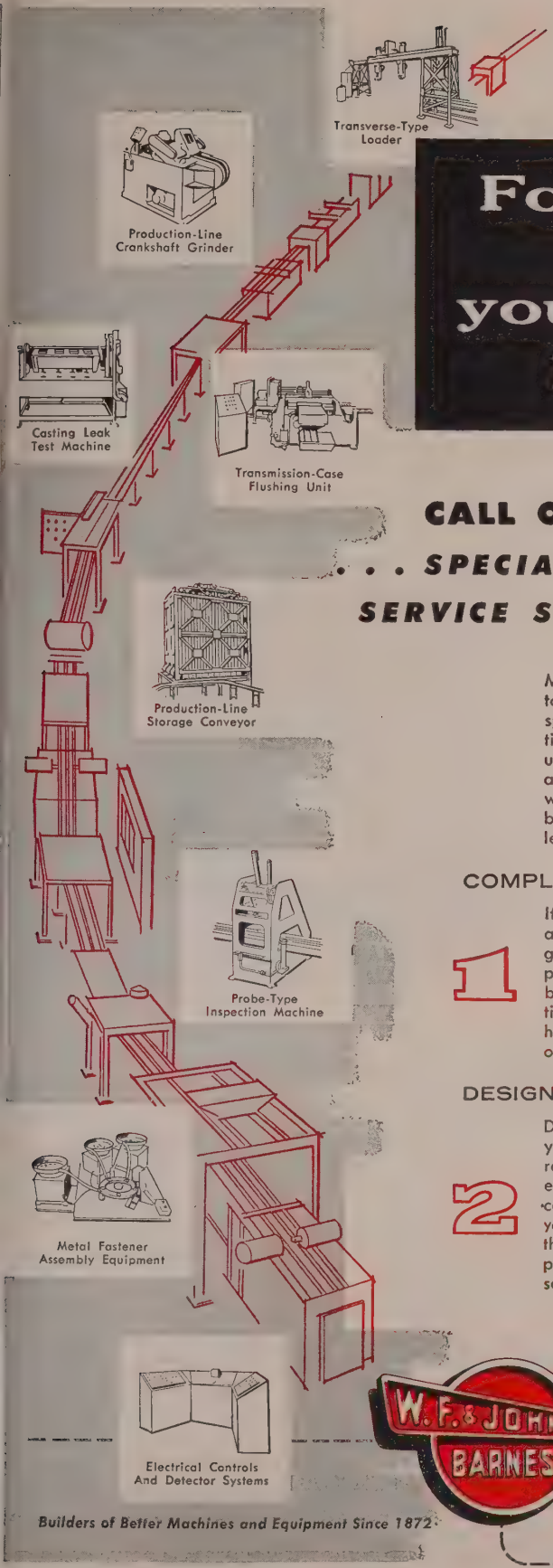
Controls for the mill and auxiliary equipment are located for greatest convenience. The operator's cabinet swivels for good visibility and accessibility. Beside the operator are petcock controls for the spray nozzles and controls for the auxiliary equipment, the reels, pinch rolls and side guard adjustment.

Versatile—The auxiliary equipment and controls for the mills give them their versatility and ease of operation. Selsyns on the screw-down mechanism indicate the roll opening. Special wrap counters on the reels show how many turns have been taken as the strip is coiled. An x-ray gage mounted on the mill measures thickness of the strip. Solenoids control mandrel expansion, pinch roll raising and lowering and side guard adjustment.

Both mills are serviced by a dual coolant system which can feed two different kinds of mineral coolant to the nonferrous strip. It is possible to put either coolant on either mill, or to put both mills on the same coolant. The system is interlocked through a series of valves, so the coolants can not be mixed.

Other Equipment—In addition to the two mills, American Brass has installed two new strip slitting lines and six stations with two bell annealing units.

The entire mill is protected by a carbon dioxide fire protection system built by Blaw-Knox's Sprinkler Division.



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Designing and building specialized, individual units to suit your specific needs is a separate, additional service. Where required, electrical, mechanical, hydraulic, fixture, and tool engineers work together as a team. All efforts are closely coordinated with complete manufacturing facilities to save you time and eliminate divided responsibility. As illustrated, this service covers hundreds of different types of automatic processing and work-handling units that are today profitably serving a wide range of industrial needs.

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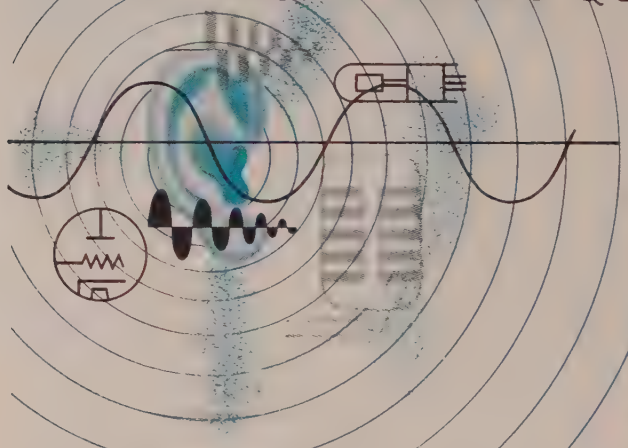

61

new sonic testing mechanism retains or rejects a casting depending on its sound waves

In their search for a positive method of inspecting critical high-stressed castings, Central Foundry engineers developed a machine (Pat. Applied For) based on a fact known to foundrymen for generations—when a casting is struck it will not give off a clear ringing tone if it is faulty. Central Foundry's electronic listening unit automatically distinguishes between the vibrations of good and faulty castings, and sorts them accordingly. This sonic tester is considerably faster and more accurate than visual inspection, and is suited to high production operation. And, most important of all, it eliminates the factor of human error.

Through its constant research, and its quick, large-scale application of that research to day-to-day operations, Central Foundry Division is continually able to offer new services to industry. For example, the new shell casting process that produces parts of much closer dimensional tolerance has been applied on a wide basis by Central Foundry. ArmaSteel, the modern casting material that possesses many of the physical characteristics of carbon steel forgings, is an exclusive Central Foundry material. To achieve better casting design and molding techniques, in the development stages, a new atomic camera that sees through castings with gamma rays is in operation here. And now sonic testing provides a further aid to improving products.

Our engineering staff, metallurgical laboratories, and high-production facilities are available to serve you in the development of new products or the refinement of existing ones. For information about shell casting or sand casting, from grey iron, malleable iron, or ArmaSteel, write for descriptive literature or a consultation with our experienced engineers, without obligation.

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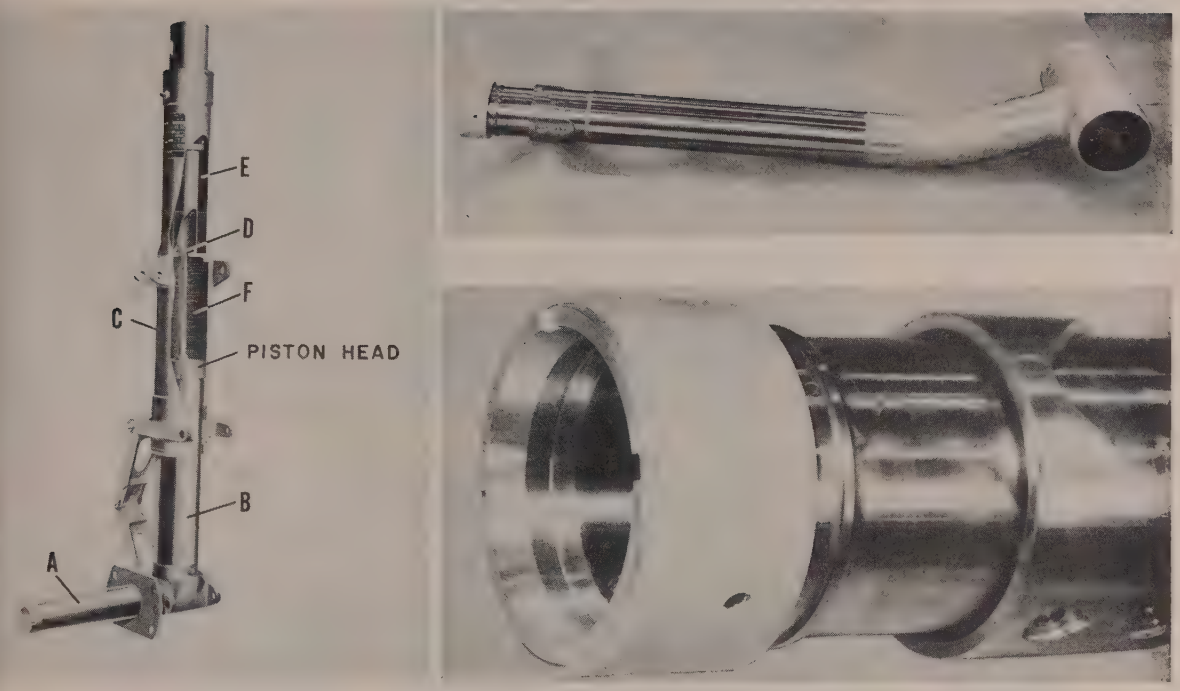

Auto shock absorbers of the airplane type work like this aircraft landing strut. Upon impact, wheel acts on axle "A", forcing piston "B" upward into cylinder "C". Fluid flows through orifice "D" into separate air-loaded chamber "E", permitting cylinder "B" to move slowly into cylinder "C". "F" is a tapered pin metering device—the farther "B" is forced upward, the smaller the orifice. Shown also are the dismantled piston and a close-up of the head

Lighter Hydraulic Pistons

IMPACT plastics molded over aluminum form the hydraulic piston heads in the latest aircraft landing gear. Plastic acts as a permanent piston ring, prevents fluid leaks from the hydraulic system and eliminates seizing common with metal-to-metal contacts.

With the shortage of metals, the use of plastics for conservation assumes new importance. Where strength cannot be sacrificed, the technique developed by Synthane Corp., Oaks, Pa., should have many applications: Bond a thermosetting, laminated plastic to metal (in this case, aluminum). Most hydraulic equipment contains pistons, cylinders, spool valves, etc., that require oil-resistant materials which retain dimensional stability over a wide range of temperatures.

Aircraft landing gear use a strut that absorbs the shock of landings. One made by the Cleveland Pneumatic Tool Co., Cleveland, uses air and oil in a simple arrangement of two telescoping cylinders. As the landing gear contacts the ground, the upward thrust forces oil through a small orifice from the lower cylinder into the upper, which contains an air chamber. Shock absorbing struts are made in diameters from 3 in. for small planes up to 10 in. for the largest.

Bonding—To bond plastic to aluminum successfully, the outside or mating surface of the metal must be knurled. The knurled cylinder is carefully wrapped with a cotton fabric impregnated with a thermosetting plastic. The fabric is heated and partially set during wrapping.

The cylinder is oven cured to complete the setting process, then machined to the required dimensions.

During curing, or setting, the plastic in the cloth wrapping becomes soft and penetrates the crevices of the knurling. The bond is said to be so tight and complete that it resembles a weld.

Strength Ratio — An important property of the plastic-aluminum piston is a high strength-to-weight ratio. The piston resists the slight corrosive action of the hydraulic fluid and prevents scoring. It has won wide-spread acceptance.

Practical Idea for the Production Man

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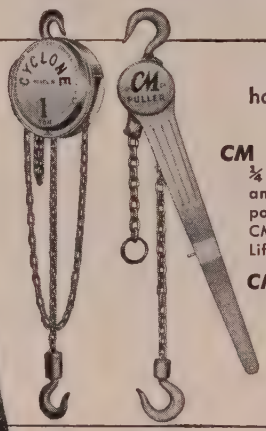
Good Suggestion for the Maintenance Man!



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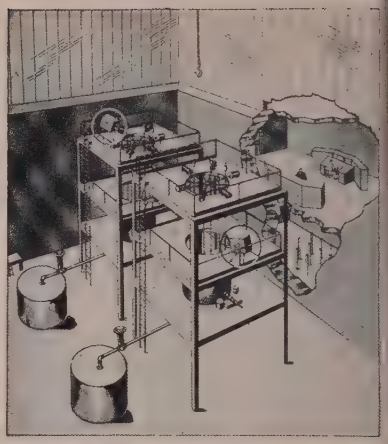


New Battelle lab for . . .

Reactor Research

REACTOR ROOM in the sketch of Battelle Memorial Institute's newly completed reactor development laboratory shows two "critical assembly" mock-ups for experiments to determine how final power reactor cores should be designed and constructed.

Closed-circuit television cameras (circled above) allow researchers to view reactor cores while experiments are being performed. Cutaway section shows the shielded control room. A vault under the control room is used to store fissionable material. Protective, 2-ft-thick concrete walls surround the reactor room.

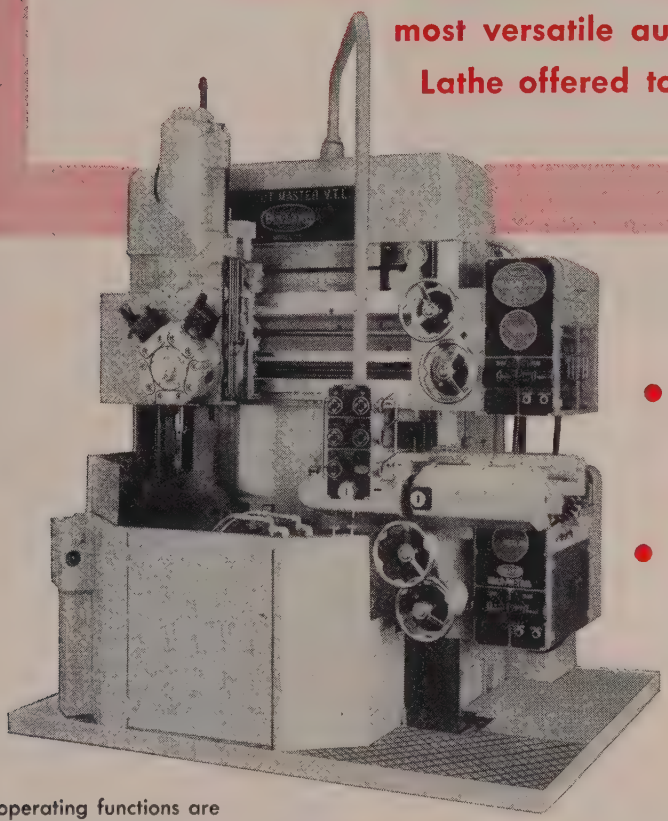
Power Plants — Battelle researchers will use the new facility to study design problems of reactors for electrical power plants and atomic engines for air, water and land craft.

The laboratory's reactor room will provide enough space for mocking-up both solid-fuel and liquid-fuel reactor cores. Ample clearance is provided so solid-fuel cores can be built with either vertical or horizontal control and regulating rods.

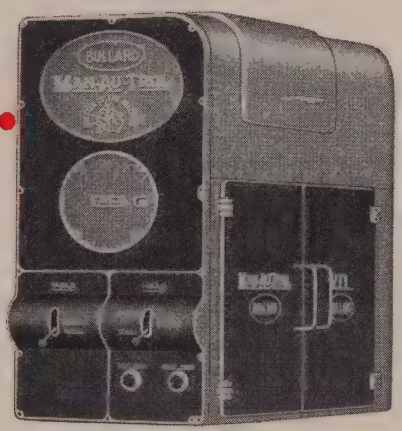
Other Facilities — The reactor development laboratory is the second major unit in Battelle's Atomic Energy Center. The first unit, a hot-cell lab, was put in operation last September. It is being used to study the effects of radiation on reactor construction materials and in other studies requiring handling of highly radioactive substances.

don't BUY BULLARD *unless* YOU WANT THE BEST!

Yes, Bullard Cut Master, Model 75 with Man-Au-Trol Conversion Unit is the best . . . most versatile automatic Vertical Turret Lathe offered to industry today . . . . .



BULLARD



All operating functions are automatically initiated and controlled by one function control drum and two detector drums in Man-Au-Trol: Table Speeds (20 Available), Feeds (16 Available), Head Travel in feed or traverse, right or left, up or down or 45° in any quadrant and Turret Indexing.

Since the function control drum can be pre-set for a given job in advance, the machine down time for job change-over is reduced to a minimum.

The Man-Au-Trol Conversion Unit can be applied to any or all heads of Cut Master, Model 75 right in your plant.

Your Bullard Sales Engineer will be glad to explain the many other advantages offered by Man-Au-Trol — your best buy in an automatic vertical turret lathe — call him or write for our new catalog.

THE BULLARD COMPANY

286 Canfield Avenue • Bridgeport 2, Connecticut

Please send me a copy of the
NEW MAN-AU-TROL, MODEL 75 CATALOG

NAME_____

COMPANY_____ POSITION_____

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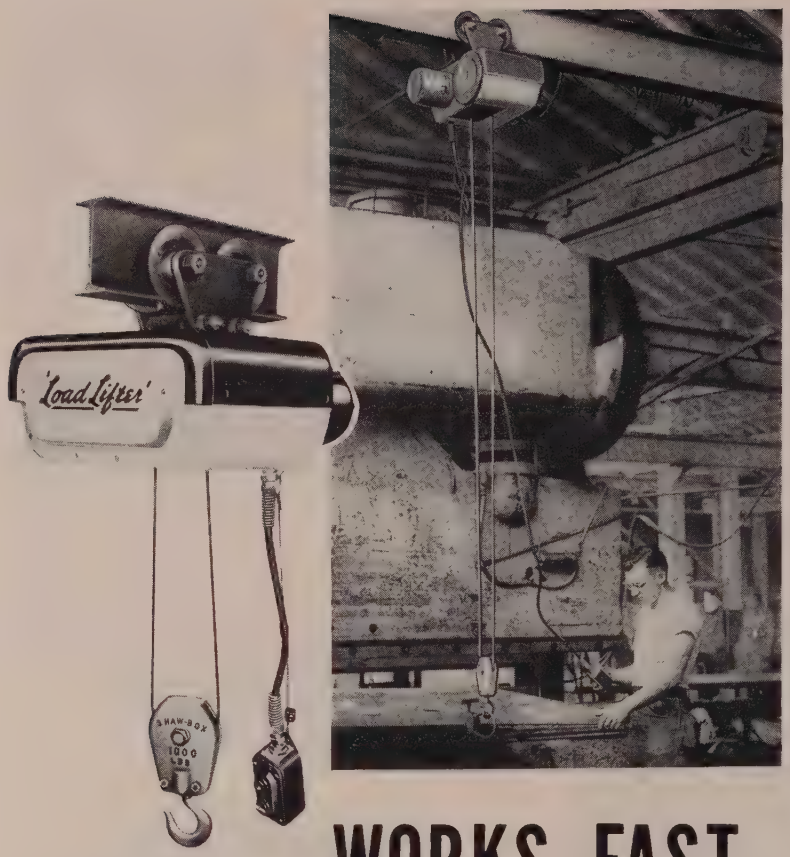
CITY_____ ZONE_____ STATE_____



WORKS FAST

TO HOLD DOWN PRODUCTION COSTS

A fast, rugged hoist is a "must" wherever loads up to a ton are lifted often in production. The Series "600" 'Load Lifter' Electric Hoist fills the bill exactly! A ½-ton load can be lifted at 30 FPM speed. The hoist has *two* automatic brakes that work together. This feature, plus handy push-button control, assures the quick action needed to "spot" loads accurately. And, the flexible wire rope saves time on narrow-angle side lifts.

Get more lifts per hour into *your* load-handling operations. Do it with the cost-cutting Series "600" 'Load Lifter' Electric Hoist. It has safe 24 volts at the push button and every other practical safeguard for man, load and hoist. Capacities: ½ and 1 ton. All types of suspension available to give you the utmost in efficiency and economy. Ask your "Shaw-Box" Distributor for details or write us for Bulletin 408.

MANNING MAXWELL & MOORE INC. TRADE MARK

'Load Lifter'® ELECTRIC HOISTS

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

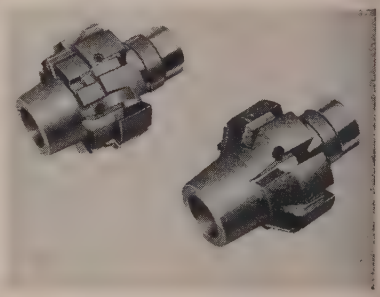
Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Makers of 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

Multicutters

Reconsider your single cutting operations; combine them with cutters like these

COMBINE separate boring, turning, drilling or facing operations into one with a single purpose cutter. That's what a large eastern diesel engine manufacturer did with the valve seats in his cylinder heads — six operations are now one.

Cutters — By adapting single purpose cutters to a radial drill, the diesel manufacturer eliminated the need for a special machine. The cutters, designed by Continental Tool Works, a division of Ex-Cell-O, Detroit, rough and finish the valve seats by boring, facing and chamfering in one pass. Stop collars on the tool holders control the depth of cut. All cutters in each holder can be replaced with a fast, hand operated Continental standard drive.

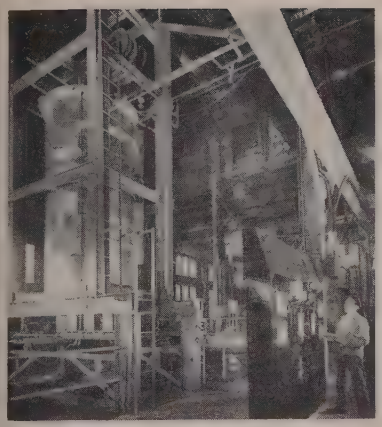


MULTICUTTERS
. . . bore, chamfer and face in one operation

Multiple cuts at one pass are also performed at two other locations in the nickel, cast iron, cylinder head—the air start check valve hole and the spray valve hole. These are machined in the same way as the valve openings—rough, semifinish, finish and chamfer.

You can save the price of a special machine only on small to medium production runs. Heavy production runs still require individually designed machinery. High output at lowered costs pays for the increased tooling cost.

The cutters hold the bits with a fast, hand-detachable Continental standard drive. A single bit can be replaced by loosening the socket head screw, then re-aligning.



Handles the Long Ones

Pittsburgh Commercial Heat Treating Co., Pittsburgh, has installed a vertical heat treating furnace that will handle parts 10 ft 8 in. long. The furnace chamber is 45 in. in diameter; maximum temperature is 1850° F. An adjacent tempering furnace of the same dimensions also is provided. The vertical furnace is stationary; quench tanks are moved under it and parts lowered into them. To load the furnace, parts are put on a movable car and pulled upward into the retort

Tape for Laminating Metal

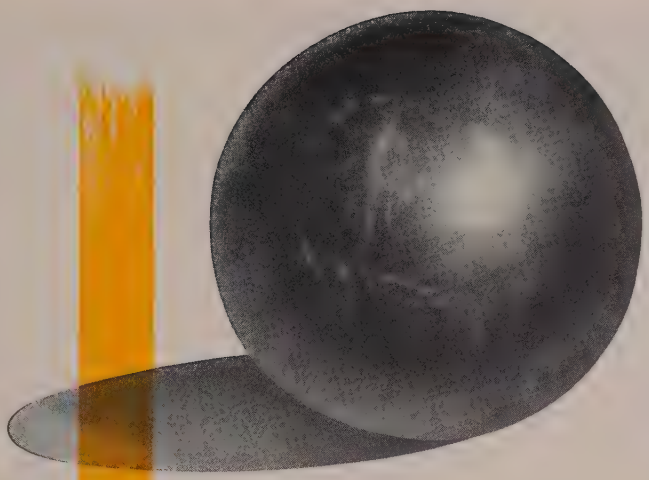
A new, transparent, double-faced "Mylar" tape can be used for laminating dissimilar or like metals where paper or cloth backings would be undesirable.

The manufacturer, Permacel Tape Corp., New Brunswick, N. J., says the tape is especially suitable for laminating when resistance to aging, low moisture vapor permeability, resistance to solvents and a not too bulky end product are desired.

Designated Permacel 94, the tape is backed with a 1-mil "Mylar" film and uses a rubber-base, pressure-sensitive heat curing adhesive. The tape is interlined with a 2-mil "Mylar" film.

Since it has high elongation and tensile strength, the tape serves well as a laminating medium for matching irregular surfaces. Elongation is 70 per cent and tensile strength is 20 lb per inch of width. Other properties: Adhesion to steel, 40 ounces per inch of width; thickness of tape, 3.3-mils; cure is at 250°F for 2 hours or 300°F for 1 hour.

As a splicing agent, the tape is useful where over-all thickness of the splice is important.



A HEAD START

IN STEEL SHOT

QUALITY

Pioneered in 1948, and backed by over 60 years' experience in the manufacture of abrasives, Tru-Steel Shot was the original High-Carbon Fully Heat-Treated Steel Shot of Tool Steel Quality!

Tru-Steel, and only Tru-Steel, has the head start in experience, in manufacturing know-how, in years of solving steel shot blasting problems!

Every heat of Tru-Steel is laboratory tested and controlled to the exacting standards of fine steel making!

Only in Tru-Steel are found the combined characteristics that have been sought for years in metal abrasives — super toughness for resistance to breakage and proper hardness for fast, thorough surface-bright cleaning.

And Tru-Steel is now packaged in 50-lb. double burlap bags — the finest packaging ever devised for metal abrasives — lighter, easier to handle, easier to stack, not slippery like slick, hard-surfaced cardboard cartons.

NOW IN 50 POUND BAG

THERE'S ONLY ONE
TRU-STEEL
Manufactured by
STEEL SHOT PRODUCERS, Inc.
Butler, Pa.
Subsidiary of Pittsburgh Crushed Steel Co.
Pittsburgh 1, Pa.

Sold and recommended by
Pangborn Corporation, Hagerstown, Md.

STOOLS

- weighing 10,000 pounds each
- alloyed 25% Cr—12% Ni
- for 1750°F. temperatures

DURALOY

These stools should offer a very pertinent tie-in with your casting requirements. Essentially, they are alloyed to resist heat. They're typical of the heavy high alloy castings we are equipped to turn out.

They will serve also to indicate what we can do in the way of producing castings to resist not only high temperatures but severe corrosion or combinations of heat and corrosion, as well.

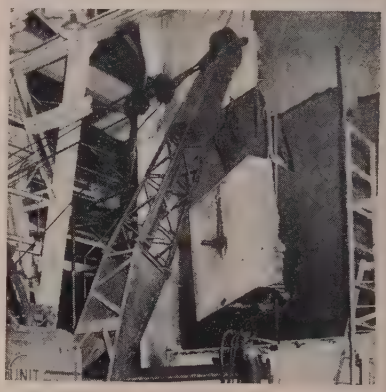
Today, we can offer several distinctly different types of castings in the high alloy field including static, centrifugal and shell-molded.

Many in both the metal working and processing fields have come to look upon Duraloy as the leading producer of exclusively high alloy castings. This reputation has been built on many years production of sound castings properly alloyed. We'll be glad to discuss your high alloy casting requirements.

THE DURALOY COMPANY

OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE: 332 South Michigan Avenue

Blowpipe cuts concrete . . .



. . . like a piece of pie

Melts Concrete

AN OXYACETYLENE blowpipe, plus metal powder, cuts concrete walls, posts, etc., into slabs for easy handling. Old concrete structures are sliced like pie.

Case history:

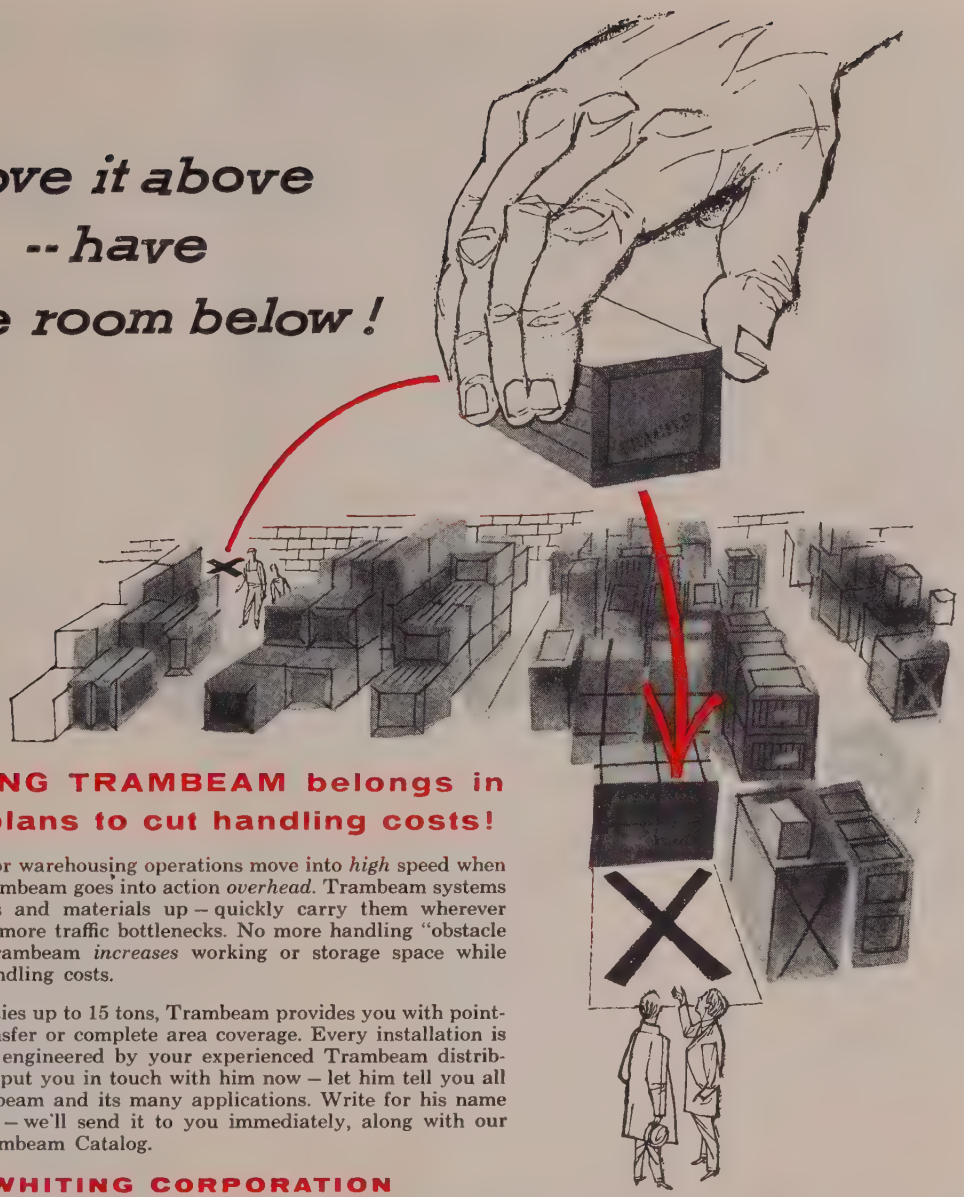
A 20 x 43 ft building in Tonawanda, N. Y., had to make way for new construction. Its walls were 10 to 18 in. thick. The crowded location made it impossible to blast; size made air hammering too expensive.

By using this method, 2928 sq ft of double-reinforced concrete were sliced into easy-to-handle squares and removed without stopping production in adjoining buildings.

A metallic powder is added to the oxyacetylene cutting flame. This increases flame temperature beyond the melting point of concrete. The powdered metal is injected into the flame automatically from a powder dispensing unit.

Only one operator is required to make cuts—horizontal or vertical. Speed of cutting depends on the thickness of the concrete.

Move it above -- have more room below!



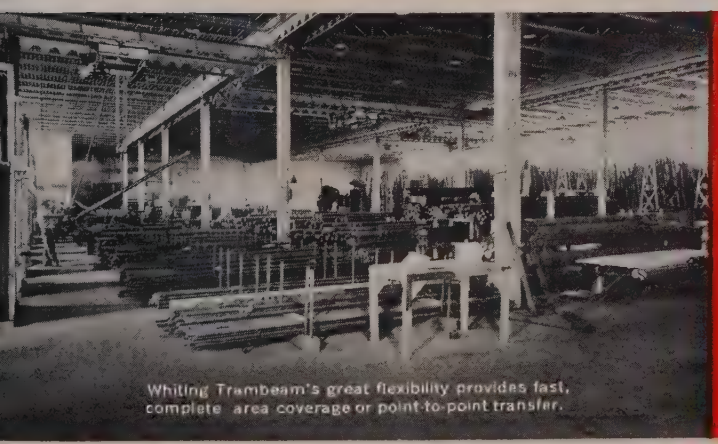
WHITING TRAMBEAM belongs in your plans to cut handling costs!

Production or warehousing operations move into *high* speed when Whiting Trambeam goes into action *overhead*. Trambeam systems lift products and materials up – quickly carry them wherever desired. No more traffic bottlenecks. No more handling "obstacle courses." Trambeam *increases* working or storage space while reducing handling costs.

With capacities up to 15 tons, Trambeam provides you with point-to-point transfer or complete area coverage. Every installation is individually engineered by your experienced Trambeam distributor. Let us put you in touch with him now – let him tell you all about Trambeam and its many applications. Write for his name and address – we'll send it to you immediately, along with our 24-page Trambeam Catalog.

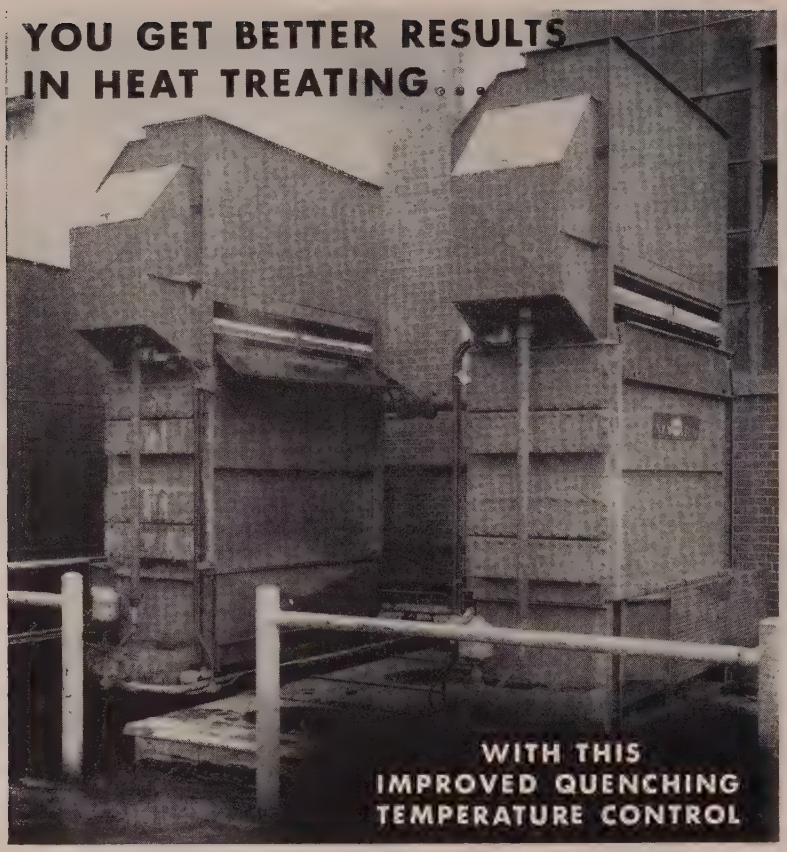
WHITING CORPORATION
15643 Lathrop Avenue, Harvey, Illinois

WHITING Manufactures Cranes, Trackmobiles, Trambeam Handling Systems; Foundry, Railroad and Chemical Processing Equipment.



Whiting Trambeam's great flexibility provides fast, complete area coverage or point-to-point transfer.

WHITING
TRAMBEAM



Photograph . .Permission of Ford Motor Co.

● Use the NIAGARA AERO HEAT EXCHANGER to control the temperature of your quench bath and you remove the heat at its rate of input, always quenching at the exact temperature that will give your product the best physical properties. You get uniform results throughout the day's production, prevent losses, avoid rejections, increase your heat treating capacity.

The Niagara Aero Heat Exchanger transfers the heat to atmospheric air by evaporative cooling. It extends your quenching capacity without using extra water. It pays for itself with water savings.

In the installation illustrated the quench is caustic soda. Water also is accurately cooled and the system is easily kept clean. With an oil quench an extra advantage is to prevent flash fires.

You can cool and hold accurately the temperature of all fluids, air, gases, water, oils, solutions, chemicals for processes and coolants for mechanical and electrical equipment. With the Niagara Aero Heat Exchanger you have closed system cooling, free from dirt and scale.

For further information write for Bulletin No. 120

NIAGARA BLOWER COMPANY

Dept. S, 405 Lexington Ave. New York 17, N. Y.

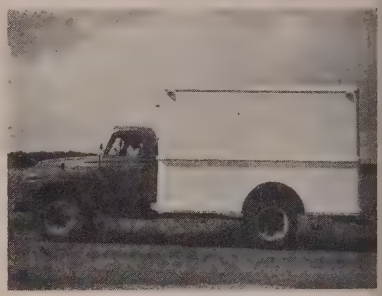
District Engineers in Principal Cities of United States and Canada

Magnesium Box

Lighter truck boxes mean more payload. Cutting the tare with light metals is a way around gross axle weight limitations

FIFTY PER CENT lighter truck body boxes are possible through the use of magnesium, according to the Dow Chemical Co. A 12-ft-long, refrigerator truck box made entirely with the lightweight material weighs only 1800 lb, compared with 3800 lb for conventional construction.

Construction — The body uses the thick sheet (monocoque) principle which eliminates the vertical side posts used in conventional construction. Because magnesium is so light, thicker sheets can be used —the metal is rigid enough without internal supporting members and offers better protection for the insulation.



LIGHTER BOX
. . . increases payload and income

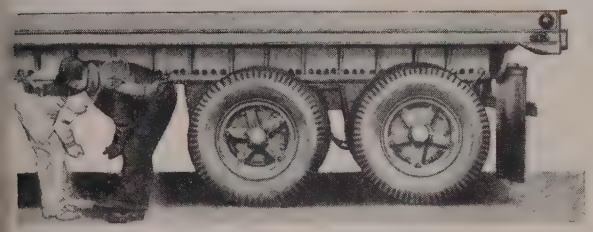
Without sideposts to interfere, insulation panels are more easily installed. The only fitting required is around doors and wheelhousings.

Insulation — Insulating panels are made from Styrofoam (expanded polystyrene) bonded on one side with plywood. The inside face of each panel is surfaced with polyester impregnated fiber glass.

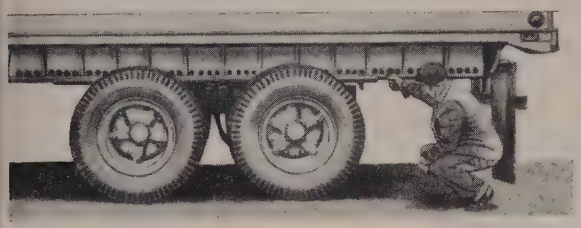
This body is one of several being built by the National Light Metals and Plastics Corp., Lansing, Mich., for the Tranter Mfg. Co. of that city. The firm is using the bodies to test truck refrigeration equipment.

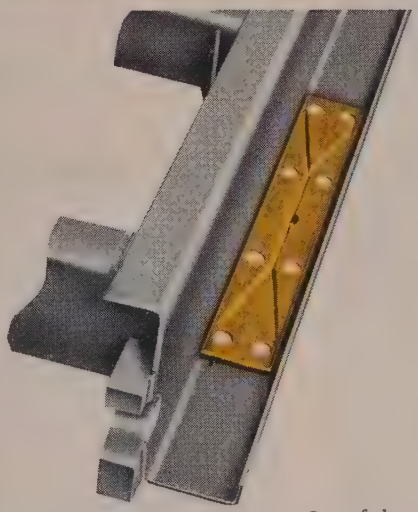
Today, with greater emphasis being put on weight limits by state road commissions, more attention is being given to lighter metals by the body builders.

Wrought Everdur* Cuts Cost in Half



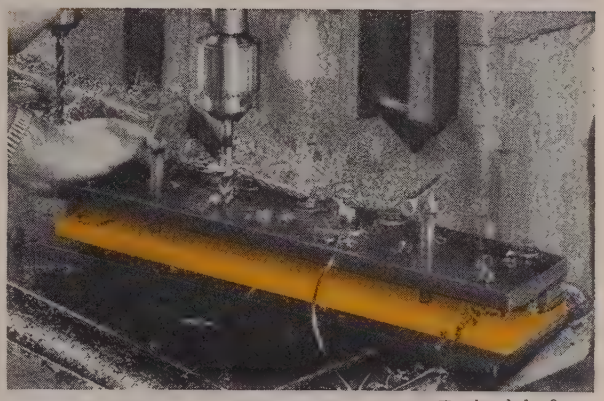
THE TRAILMOBILE SHIFTABLE TANDEM—Truckers often lose time and money in shifting trailer cargo, changing tractors, or cutting payload to meet legal axle-weight requirements. Now, however, they can balance any load in just five minutes by moving the Shiftable Tandem Axle Assembly made by Trailmobile Inc., Cincinnati, Ohio. The axle assembly slides forward or backward, as needed, along a stainless steel rail on four shoes of wrought Everdur. It can move 66 inches and be locked at 3-inch intervals by locking rods through holes in the rail.



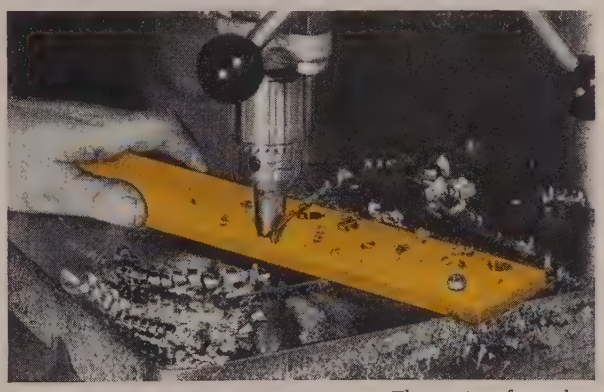


EVERDUR CAN TAKE THE LOADS AND SPLASH—One of the shoes of wrought Everdur installed in the Shiftable Tandem frame. An Alemite fitting in center hole and oil grooves provide lubrication. The Everdur shoes carry normal tandem loads of 32,000 pounds day and night, and slide freely under this pressure. Resistance to corrosion is another reason why Everdur was selected, for unlike the trailer's cargo, the Everdur shoes are exposed to road splash of varied mixtures.

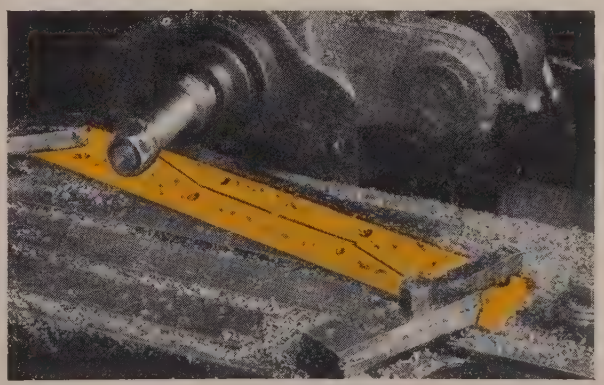
Wherever metal must resist corrosion, be strong and tough, and be available in forms easily fabricated, consider Everdur, Anaconda's family of copper-silicon alloys. The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. *Reg. U.S. Pat. Off. 5661



HOW WROUGHT EVERDUR CUT MATERIAL COSTS—Trailmobile first tried high-tin bronze castings for the shoes on which the assembly slides. But rejects for porosity and warpage in the thin cast section were a costly problem—and all surfaces had to be finish-machined. The wrought Everdur bar stock suggested by Anaconda's technical experts has surfaces satisfactory as delivered—ready for drilling holes (shown above).



HOW WROUGHT EVERDUR CUT LABOR COSTS—The castings formerly used were not uniform. Hard spots made surface machining difficult and expensive. The entire operation was unnecessary with wrought Everdur bar stock—reducing labor cost by about 50 per cent. (Above) Countersinking holes for screw fastenings.



WROUGHT EVERDUR IS READILY MACHINABLE—Though tough and dense, wrought Everdur is uniform and poses no special problems in machining. Oil grooves are shown being milled in the shoes.

EVERDUR

ANACONDA® COPPER-SILICON ALLOYS

Nerve center of the conveyor system: The dispatcher's station where conveyors from three production lines (left) meet the conveyor going to final assembly (right). The dispatcher transfers matched parts from the production conveyors to the final assembly conveyor

Doubled Production Rides on Cables

PRODUCTIVE capacity doubled without an inch of increase in floor space. You can see this rabbit-out-of-the-hat trick at the Electric Motor Division plant of A. O. Smith Corp., Tipp City, O.

In accomplishing it, the company believes it has achieved the greatest dollar volume production per square foot of any company in the small motor business (¼ to 3 hp). A good part of the reason hangs overhead: 1¼-miles of cable and chain conveyors in 90,000 sq ft.

Long Pull — Lightweight cable conveyors, made by the Tipp Mfg. Co. in Tipp City, comprise about 85 per cent of the overhead installation. Originally, they were installed because of their suitability for the light loads encountered in manufacturing small motors. In the last five years, they have been revamped and extended frequently, often over weekends, without interrupting production the following week.

Today, the plant uses only one lift truck. Parts and materials move on conveyors from the moment they arrive at the plant door until they emerge as finished motors at the shipping dock. Overhead chain conveyors, also furnished by Tipp, are used for extremely heavy loads.

Two Rules—The company follows two principles in making such extensive use of overhead cable conveyors:

1. Manufacturing processes are planned first and laid out in proper sequence with three-dimensional models. Conveyors are installed to give maximum assistance both in moving parts and materials along production lines and from one line to another.

2. When a part is removed from a conveyor, it is always placed (after work has been done on it), either on another line or on a different hook on the same line.

Operators or inspectors transfer parts from one conveyor to another to keep indirect costs down.

Flow—Each cable conveyor loop moves continuously, at some point passing near another loop. Production operations are performed either within a conveyor circuit or in the area between two adjacent loops. Parts and materials removed for such operations as stamping, winding, painting, baking and testing go back on conveyors after each operation.

As materials and parts come into the unloading area at one end of the building, they move by overhead conveyors down three separate lines: 1. Rotor and shaft assembly. 2. Frame stator and coil assembly. 3. End frame production.

Jam Up — At the end of each line, where components are ready

for final assembly, there was a serious bottleneck. "We knew that up to this point, the overhead conveyors were doing a good job for us," says S. Dwight Mills, assistant division manager. "But there wasn't the proper connection between the production line conveyors and those moving along the final assembly line. Except for frame stators and coils, parts were delivered to the assembly line in four-wheeled carts.

"There was congestion at the head of the line, where dispatchers worked out of the carts. Expediters were running all over the place, trying to make rotors, stators, and end frames come together in proper numbers for assembly. All too often, parts would be delayed or misplaced."

Nerve Center—The key to the solution turned out to be a dispatching point, nerve center of the whole installation. A single dispatcher, stationed on a mezzanine at the converging point of conveyors from the three separate production lines, performs a function formerly requiring up to 15 men.

Working from production control schedules and parts lists, he removes a rotor shaft assembly, a frame stator and coil assembly and two end frames from the incoming conveyors.

He hangs this matching set of components on three-tiered hangers suspended from an overhead cable conveyor that moves past him to the final assembly line. As further insurance that proper parts will be dispatched, basic parts are stamped with numbers.

Purchased parts and subassemblies are picked up when the conveyor, on its way to final assembly, flows through a stockroom on the main floor. A worker on final assembly merely removes components from a conveyor hanger, and he has the essential elements for putting together a finished motor. As a further refinement, an automatic unloader is under test for removing hangers from the conveyor at the assembly stations.

More Room—In one area, 4000 sq ft were formerly needed for machining frame stator and coil assemblies. Parts moved through it on floor-mounted roller conveyors. When overhead cable conveyors were installed, the area needed for machining was immediately reduced to 2400 sq ft.

Production between conveyor loops: Parts removed from one conveyor go on another after work is performed on them. Virtually all storage is in motion

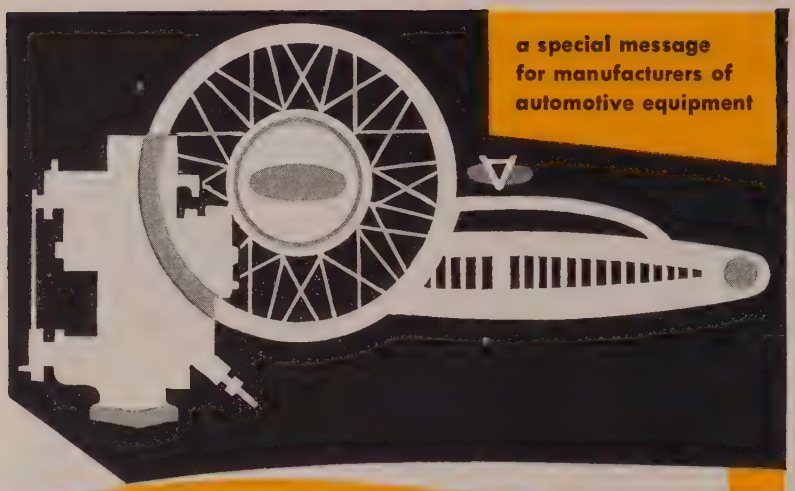
Visual inventory: When conveyors become fully loaded (as here) it is easy to see where production needs cutting back and where it needs stepping up

Efficiency of handling was improved through a tiered hook arrangement on the conveyors. Each machinist takes parts from an assigned hook in the tiers. After machining the parts, he places them on the next lower hook.

About 6000 sq ft of floor space was needed for temporary storage of the basic motor assemblies. The components now move around on continuous overhead conveyors, serving the same storage purpose, until they are needed for final assembly. The floor space saved is used for manufacturing.

Close Check—An extremely important function of the conveyors is to control work in process by providing visual inventory. If all the hooks going to the final assembly line are filled, assembly operations can go on for 6 hours, even if no more parts are made.

To make sure that assembly work never falters, and to keep part production in balance with assembly, a close watch is kept on the conveyors coming to the dispatcher from the three main production lines. If stators are being turned out faster than they go to final assembly, production can be cut back. If there are too many empty hangers coming from the stator production line, output is stepped up.



a special message for manufacturers of automotive equipment

need a finish for low cost corrosion protection or showroom sparkle?

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Whether you're finishing non-ferrous parts for high corrosion protection, paint base, or for showroom sales appeal, you can be sure of low material and production costs and peak performance when you specify Iridite. Here's what you can do with Iridite:

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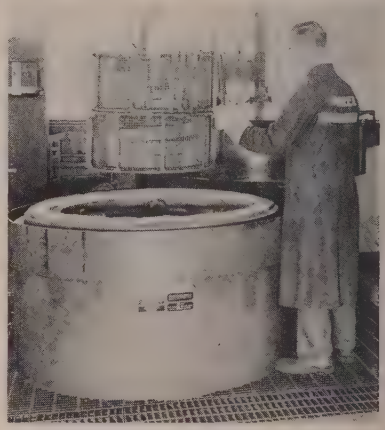
Inconel Baskets

Make better use of the space inside to lower furnace operating costs

NITRIDING furnace loads can be increased by using baskets made of Inconel. In a pit-type furnace, small parts usually are not processed with the long, narrow ones. With the baskets added, small parts can be loaded in the unused top of the nitriding chamber and the long narrow parts suspended beneath.



Nesting parts in Inconel baskets increases the usefulness of this pit-type nitriding furnace

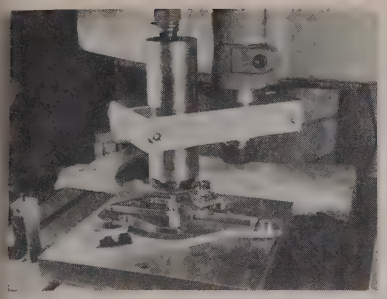
Wiretex Mfg. Co., Bridgeport, Conn., makes a variety of Inconel baskets for nitriding furnaces. Half-round baskets allow spindles to be inserted on one side; finer mesh baskets hold tiny parts.

The baskets are not damaged by varying nitriding atmospheres. In one application, varying degrees of ammonia dissociation are used and temperatures range up to 975 to 1000°F. Cycles vary from 45 to 180 hours.

Titanium Handbook

A two-volume, Air Force handbook on titanium is ready for industry. Part I is in three sections covering titanium production, physical metallurgy and properties. Part II covers laboratory and fabrication.

Order PB 111631 and 873 from OTS, U.S. Dept. of Commerce, Washington 25. Price: Part I $3; Part II $4.25.



Die Sinker Turns Grinder

To eliminate buying special grinding equipment for short run jobs, Glenn L. Martin Co., Baltimore, replaced the cutting head on a die-sinking machine with a high-speed air motor. The pantograph tracing feature of the machine permits precision grinding of cam follower surfaces

Piping Stems Acid Corrosion

Unplasticized polyvinyl chloride (PVC) piping systems form part of the new $50,000 chromic acid recovery and solution purification facilities at Perfect Circle Corp., Hagerstown, Ind.

There are five applications of PVC piping in the plant:

1. Lines (1¼ and 1½-in.) are used on the deionizer. Deionized water, rather than distilled, is used in the plating operations.

2. Lines (2 in.) serve a 1500-gallon dilution tank where chromic acid is handled in concentrations of 10 to 40 per cent.

3. Lines ranging from 1 to 2 in. serve a 1500-gallon adapter tank where water containing a 1 per cent concentration of chromic acid is processed.

4. Lines (2 in.) connect to a 350-gallon sulphuric acid regenerant sump tank.

5. A 2½-in. line is used for drainage of regeneration wastes.

The PVC operating pressures at Perfect Circle are 25 to 75 psi. Temperatures go from 50 to 90°F.

Advantages — Scale, commonly found in metal lines, is not present; the acid and make-up water are protected against discoloration and contamination.

Hazards to personnel and equipment, caused by leakage due to corrosion, are avoided. The piping requires no paint.

The piping was fabricated with injection molded fittings made by Tube Turns Plastics Inc., Louisville.

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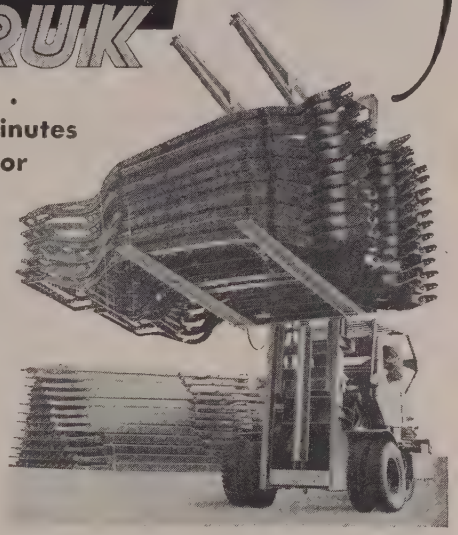
10-12-15
Ton Capacities
FLUID DRIVE
POWER STEERING

"72 frames per load . . . three lifts every four minutes . . . proves our needs for additional LIFTRUKS"

The SILENT HOIST Heavy-Duty Fork LIFTRUK so rapidly stepped up the production and movement of material, over past handling methods, that this Plant Manager (quoted above), was equally quick to anticipate *fleet* LIFTRUK operations in their plant. *Another example that LIFTRUK pays its way!*

Can we aid in solving your problems? Send for Bulletin #77.



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Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
849 63rd Street, Brooklyn 20, N. Y.

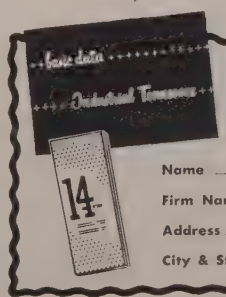
Inexhaustible Water Supply

as soft as 11 parts per million

Another of 14 reasons to locate your plant in TENNESSEE

To give you a quick picture of Tennessee markets, labor, cities and towns, industrial capacity, power, fuels, transportation, water, raw materials, tax structures, wages, financial assistance, construction costs and recreational facilities, we've prepared a terse folder entitled "14 Reasons Why Manufacturers Can Profit More in Tennessee."

If you are considering plant expansion you will find this folder and our 28-page "Basic Data" book invaluable first steps in choosing your final location. To get both in confidence and without cost or obligation, just fill out and return the coupon below.



Tennessee Industrial and Agricultural Development Commission
S-I Cordell Hull Bldg., Nashville, Tenn.
Please send "14 Reasons" and "Basic Data"

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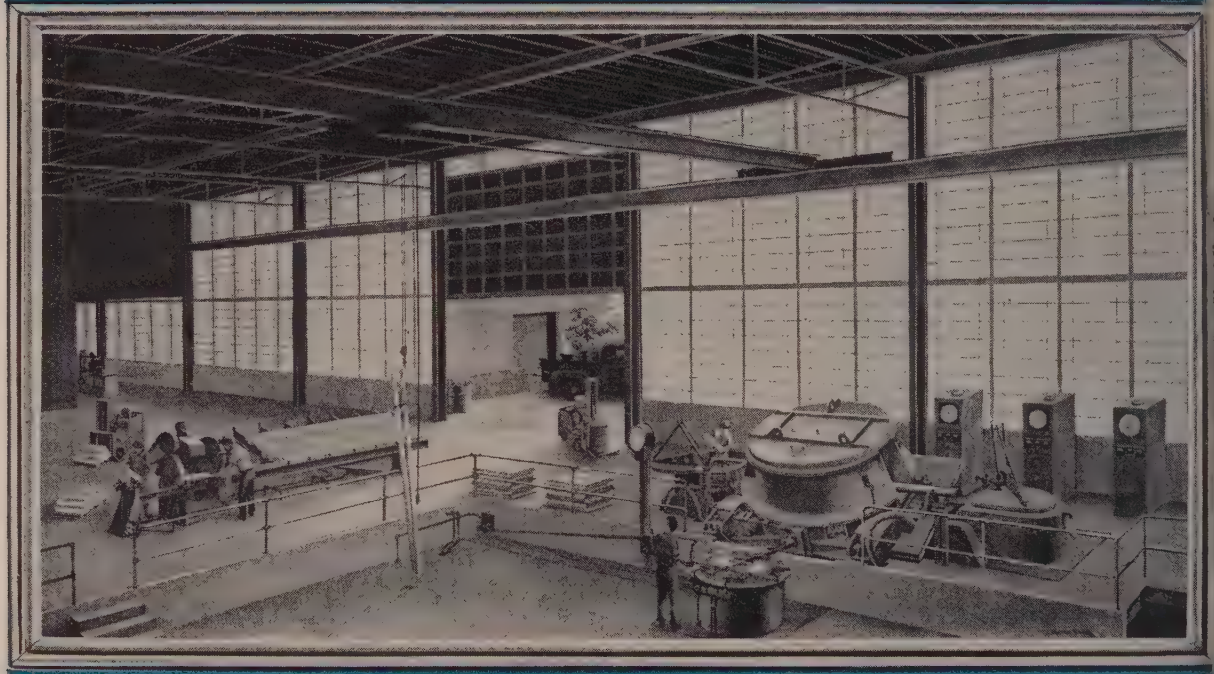
Will Reduce Metal Costs for You Too!



INSTALLATION AT VALLEY METAL PRODUCTS COMPANY - PLAINWELL, MICH.
(SUBSIDIARY OF MUELLER BRASS CO.)

Photograph from an oil painting by J. Gordon White

Manufacturers of "Vampco" architectural life long aluminum alloy extrusions, Valley Metal Products Co., use Ajax furnaces exclusively in their billet casting shop, because these furnaces enable them to produce aluminum alloy billets from selected scrap in the high quality required for their product.

The compact layout of this casting shop, shown in the picture, includes two 166 kw Ajax melting furnaces and one Ajax 10,000 lbs. holding furnace which pours into a semi-continuous casting machine. Operation is continuous. *Production is 750,000 lbs. per month.* Metal losses are below 1%. The holding furnace requires no fluxing or chlorinating. Maintenance is low. Working conditions are comfortable and permit full utilization of all productive efforts.

SEND FOR BULLETIN R-40

AJAX

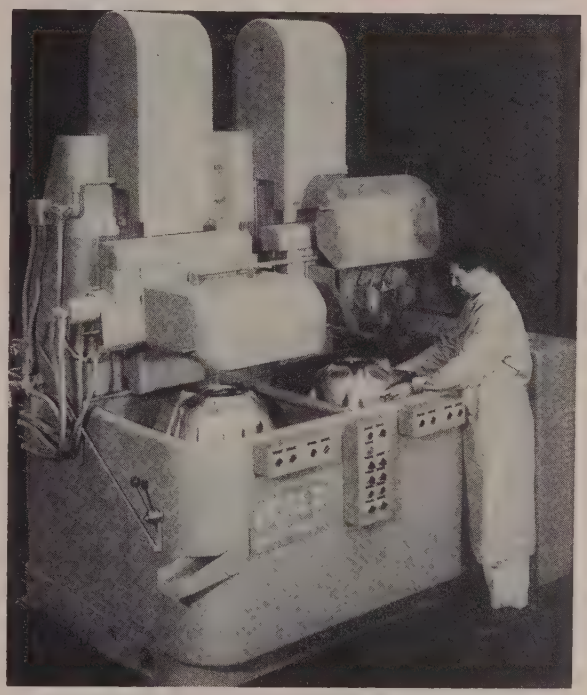
TAMA-WYATT

AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., The Ajax-Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

Two-Station Boring Machine Does Multiple Operations



Flywheels, impellers, bell housings, clutch plates and similar parts can be turned out in high production by the vertical boring machine.

Continuous work flow can be maintained by loading one station while the other is boring, chamfering or facing. Each station may be operated independently.

Machine and cycle control pushbuttons are grouped at the front of the machine. Double pushbuttons make the operator use both hands to start the cycle.

Work pieces are loaded onto rotating fixtures which are mounted on vertically positioned boring heads.

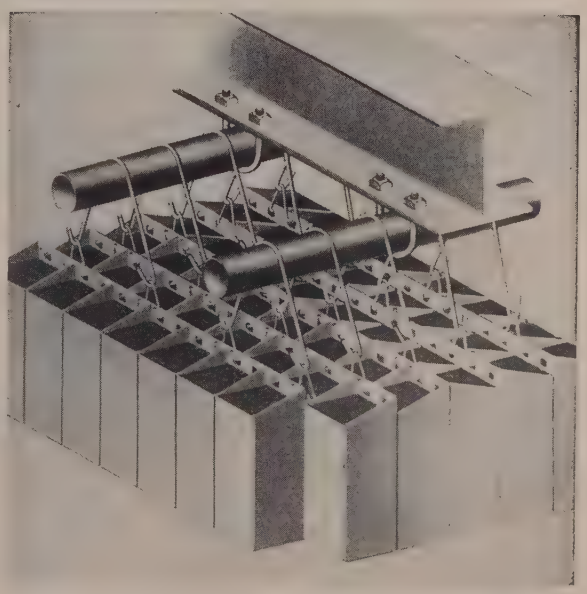
The heads are driven by individual motors mounted at the rear of the base.

Sloping chutes make chip disposal easy. They permit the chips to fall below the work where they may be removed manually or by a conveyor.

Vertical hydraulic-operated slide units mounted on the base column can be arranged to carry a variety of tooling or auxiliary tool slides. The use of angularly mounted auxiliary slides allows the tooling to approach the work over a wide range of angles.

Capacity of the machine ranges up to parts having a diameter of 16 in. *Write*: Heald Machine Co., Worcester 6, Mass. *Phone*: 5-3191

Basic Roof Gives Longer Life in Open Hearths



Suspended, metal-cased basic brick roofs increase furnace availability by allowing more heats between repairs.

The flat suspended arch reflects radiant heat to the bath uniformly.

In this suspension, the tiles are supported from the casings entirely outside the refractories.

They are eccentrically supported so as to cause the tiles to abut each other, thus eliminating air infiltration between the tiles. (Air infiltration is the primary cause of metal casing growth.)

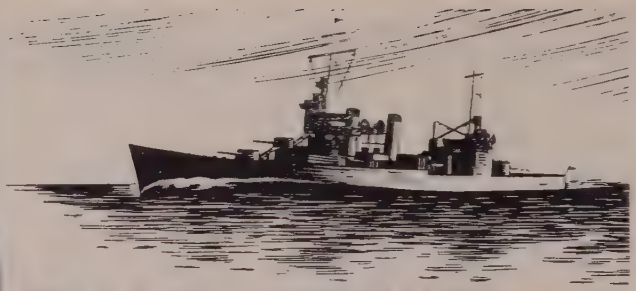
The roof is divided into rectangular squares of 16 tiles, 4 tiles in each direction.

Around the perimeter of each of these squares is a nonoxidizing metal seal. The seal has proved successful in fantail nosings and basic refractory fairing arches.

No castings are used in the roof support and supports are not embedded within the refractory.

The new support tends to hold the tiles together and reduces the pressure against the buck stays or skew backs.

Because of the eccentric method of support, tension springs at the skew backs are not needed but can be used if already installed. *Write*: Geo. P. Reintjes Co., 2517-19 Jefferson St., Kansas City 8, Mo. *Phone*: Harrison 3570

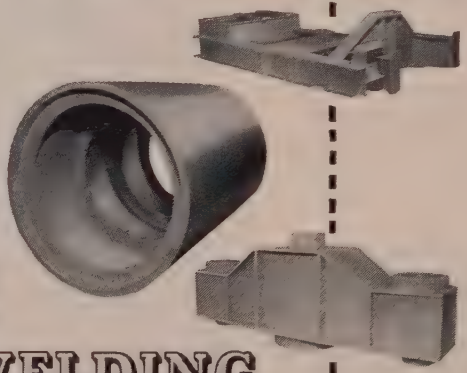


NAVY CRANE RIDES HIGH on ACME Weldments

220 feet below the hook is quite a reach. When the Navy needed a portal crane that big to swing heavy sections on to vessels under construction, the Derrick & Hoist Corporation of Long Island City designed and built a diesel-electric giant with the right reach and a capacity of 50 long tons. *Carrying this big load are all-welded components fabricated by Acme Welding.*

ACME weldments were chosen in place of castings to assure *greater strength, rigidity,* and complete absence of flaws . . . to eliminate pattern cost . . . to provide greater design flexibility. If these advantages of welded fabrication are important to your product —especially when combined with exact adherence to your specifications—why not investigate Acme weldments *today*.

Send us your blueprints for a prompt quotation and ask for our informative booklet, "The FACTS about WELDMENTS and CASTINGS."



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NEW PRODUCTS and equipment

Spot Welder

A fully automatic spot welde can make 100 welds a minute c 18 gage steel and handle lighte gages as fast as the operator ca feed them.

The power factor of the trans former welder is 70 per cent.

Welding horns can be moved i and out and rotated 360 degree for maximum versatility. A self compensating pressure switch elim inates the need for adjustmen when pressure is changed.

Radial windings give maximum ventilation and long unit life *Write:* Brennen, Bucci & Webe Inc., 262 Mott St., New York 12 N. Y. *Phone:* Canal 6-2356

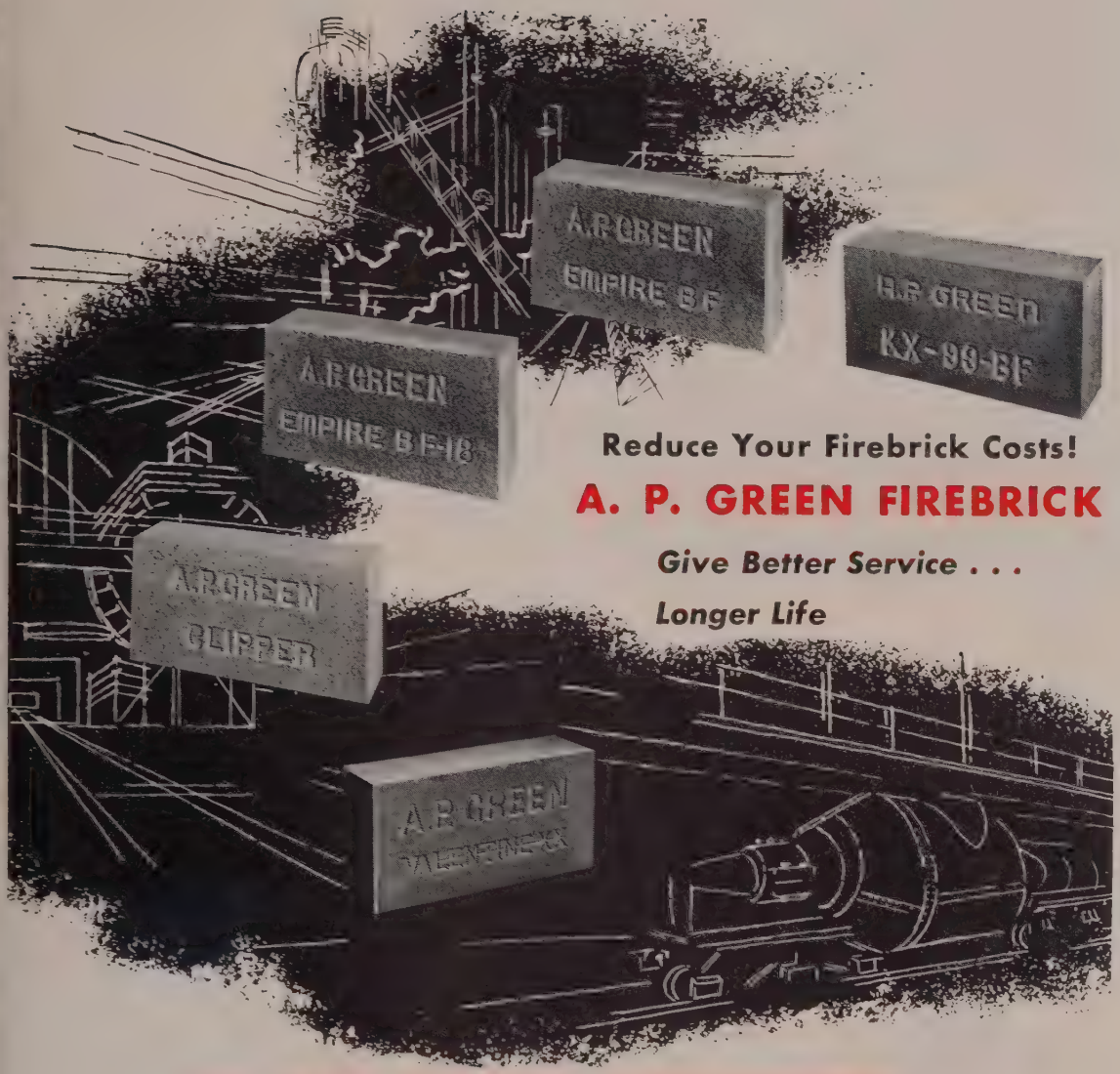
Cabinet Dial Scales

Precision performance is insure by this new line of scales.

Weighing is speeded up and er rors are eliminated because th weighman does not have to ad the weight from the drop weigh window to a second weight shown at the tip of a dial indicator.

A full swivel head makes it pos sible to turn the dial chart in any direction.

Cabinet dials use a hydrauli shock absorber and oscillation



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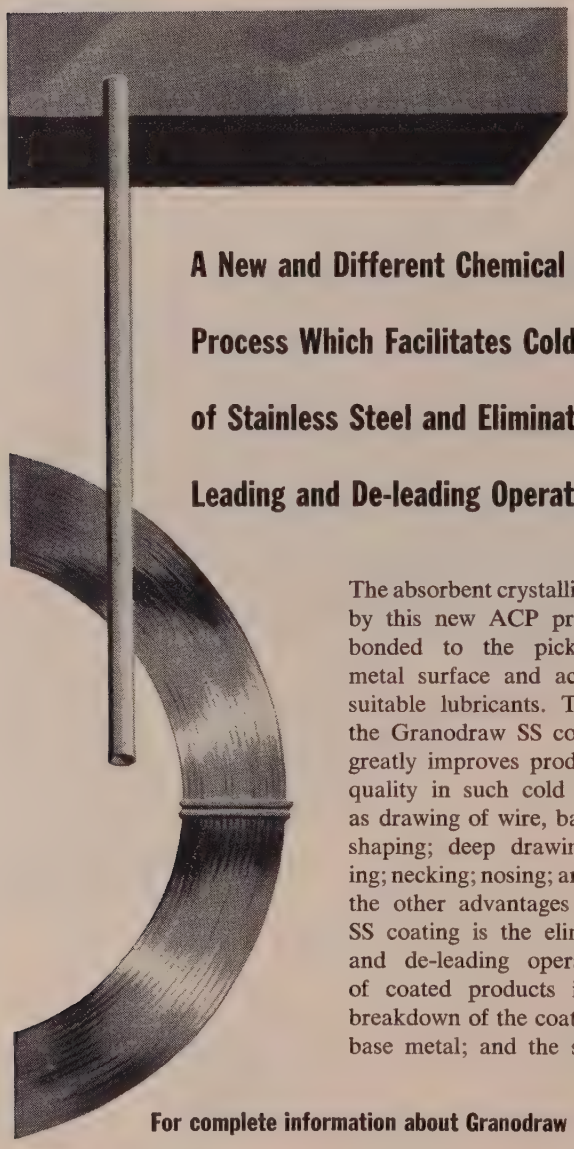


A New and Different Chemical Coating Process Which Facilitates Cold Forming of Stainless Steel and Eliminates Leading and De-leading Operations

The absorbent crystalline coating produced by this new ACP process is chemically bonded to the pickled and activated metal surface and acts as a carrier for suitable lubricants. The combination of the Granodraw SS coating and lubricant greatly improves production and product quality in such cold forming operations as drawing of wire, bars and tubing; cold shaping; deep drawing; stamping; ironing; necking; nosing; and upsetting. Among the other advantages of the Granodraw SS coating is the elimination of leading and de-leading operations; the storing of coated products indefinitely without breakdown of the coating or pitting of the base metal; and the short coating cycle.

For complete information about Granodraw SS, write ACP today

AMERICAN CHEMICAL PAINT COMPANY, Ambler 19, Pa.
DETROIT, MICHIGAN • NILES, CALIFORNIA • WINDSOR, ONTARIO

CHEMICALS ACP PROCESSES

damper to counteract shock coming from the scale platform.

Scales are available in 36 models ranging in total chart capacity

from 500 lb by ½-lb graduations to 120,000 lb by 20-lb graduations. *Write*: Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill. *Phone*: Harrison 7-7100

Centrifugal Fans

Here's a line of fans for industrial ventilating, air conditioning and heating. The fans can handle hot air and gases up to 600°F.

Backward curved fans have better than 80 per cent efficiency. The forward curved fan is quiet and has a large capacity at slow

speeds. Both types come with direct or V-belt drives.

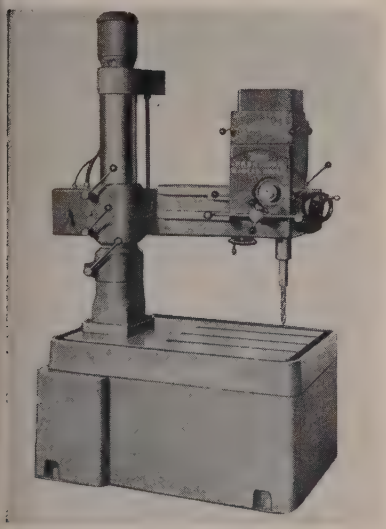
All wheels are dynamically and statically balanced. Diameters range from 12¼ to 143 in. Volumes go up to 324,960 cfm. *Write*: Chicago Blower Corp., 9869 Pacific Ave., Franklin Park, Ill. *Phone*: Gladstone 5-4780

Radial Drill

Tools, dies, jigs and fixtures weighing up to 5 tons can be drilled on this precision machine.

The column is flame hardened. An individual motor raises and lowers the 3-ft arm.

All operating parts of the self-contained transmission are sealed in oil. Gears are hardened and shafts are mounted on ball bearings.



Conveniently grouped controls are mounted on the transmission face panel and sides.

There are 16 geared speeds from 50 to 1400 rpm. The right feed for the speed and size of drill is given by four lever-controlled power feeds. *Write*: Veet Industries, 25753 Groesbeck Highway, East Detroit, Mich. *Phone*: Prescott 6-3000

Metal Treatment

Rusting action is stopped and the metal is prepared for painting when this new compound is ap-

This Quick Demonstration At Your Desk Will Prove How To Get Better, Economical Fastening With Townsend Lockbolts

A few minutes of your time invested in watching a simple demonstration of a better fastening method may point the way to savings of thousands of dollars in assembly of your products. The Townsend lockbolt provides a quick method of producing tight, rigid fastenings that cannot loosen even under extreme vibration or shock conditions.

We would like to have a Townsend engineer demonstrate to you and others in your organization how these lockbolts combine the advantages of riveting and bolting—eliminate the disadvantages. He will show you that installation is fast—that fewer workers can complete an assembly in less time—you improve your product—achieve a lower installed cost.

You will be able to see why the clamping action, or clinch, of Townsend lockbolts is higher than rivets—is more uniform than bolts and nuts. The demonstration will explain how the lockbolt fills the hole better than other fasteners—makes possible a more rigid joint and provides an effective liquid seal.

Townsend lockbolts are available in steel and aluminum alloy, in 3/16", ¼", 5/16" and 3/8" diameters, in grip length ranging up to 2", in various head styles.

For a demonstration on how to speed production, get tight, secure, permanent fastening with Townsend lockbolts write on your company letterhead to Townsend Company, P.O. Box 237-C, New Brighton, Pa.

Licensed under Huck patent nos. RE 22,792; 2,114,493; 2,527,307; 2,531,048; 2,531,049.

THE FASTENING AUTHORITY

Townsend

COMPANY • ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Rivet Division • Santa Ana, California

In Canada: *Parmenter & Bulloch Manufacturing Company, Ltd., Gananoque, Ontario*

plied on rusted surfaces.

The material changes rust (iron oxide) to iron phosphate. Paint adheres so tightly to it that moisture cannot get through.

Scraping, flame cleaning and sandblasting are not needed; simply wire brush the loose rust and scale off the metal surface.

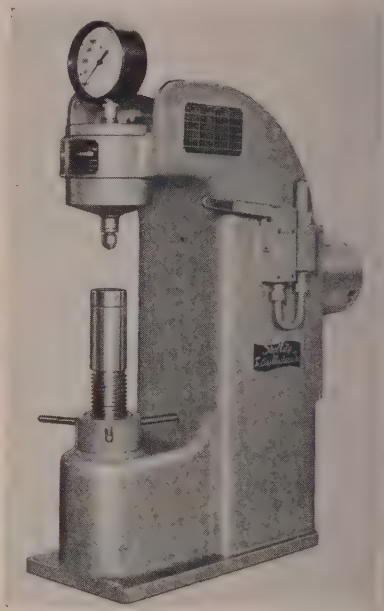
The material imparts a slight etch to new metal, producing microscopic hooks that assure a good bond between metal and paint.

The compound is a balanced formula of phosphoric acid and dichromate with extenders and wetting agents. *Write*: Rusticide Products Co., 3125 Perkins Ave., Cleveland 14, O. *Phone*: Prospect 1-1590

Hardness Tester

A ¾-in. stroke on this motorized Brinell machine eliminates anvil adjustment on pieces of about the same thickness.

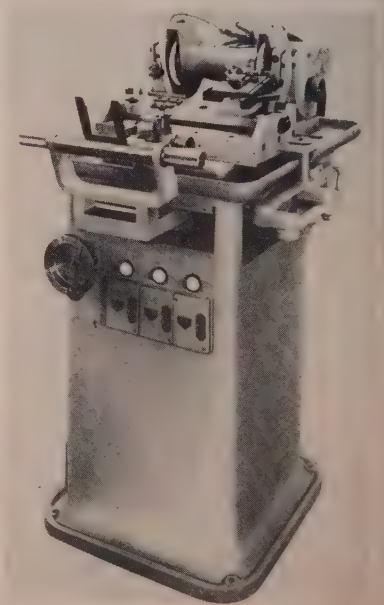
Movement of the Brinell ball, as the load is applied, is slow to avoid any impact or overloading. The vertical opening is easily adjustable by turning a three-spoked elevating nut from a maximum 9 in. to zero. Throat depth is 6 in.



The load is easily adjustable. *Write*: Steel City Testing Machines Inc., 8817 Lyndon Ave., Detroit 38, Mich. *Phone*: Webster 3-3500

Copy Grinding Machine

This machine can make two duplicate lathe tools, two form tools.



March 19-23
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The 453 selected
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The best and latest in tools, machines, inspection equipment, automation devices, controls and accessories to cut costs and boost profits—many never before shown anywhere.
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For the big plant
See them at ASTE's Greatest Show
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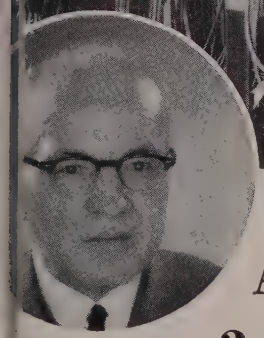
Sponsored by the 32,000 men responsible for designing and selecting the best in production equipment. Write for advance registration blank today.
Equally important, plan to attend the 5-day, all-industry conference covering the latest developments in manufacturing techniques and equipment.
AMERICAN SOCIETY OF TOOL ENGINEERS



A plant manager asks 3 leading questions about V-belts

1 "I stock 85 different sized sets of belts—how can Veelos help me?"

With *four* 100′ reels of Veelos (O, A, B, C widths) you can replace as many as 316 different sizes of endless belts —and store your Veelos in *inches of space!* Veelos cuts your inventory to a minimum. No obsolescence or deterioration, no worries about specific sizes. With Veelos, your storage and inventory problems are licked!

2 "How does Veelos cut installation and down-time?"

Veelos is an *adjustable belt.* With Veelos, there's no tearing down outboard bearings, no resetting, tilting or moving motors to make belt replacement or repairs! And you don't have to replace a complete matched set because of one loose belt—Veelos belts adjust to any length, can be altered by adding or removing links!

3 "How do I eliminate costly belt vibration?"

Install Veelos in place of ordinary belts! Veelos belts are absolutely uniform; every stud and link is identical; every foot of the reel is identical and uniform; they're perfectly balanced. Your Veelos salesman can easily prove to you with a Veelos Vibration Analyzer (tested against any V-belt you might now be using) that Veelos *cuts vibration up to 90%!*

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THE BALANCED
LINK V-BELT

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Get your free Veelos Data Book; many pages of important information on belt drives. Write to:

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"Industrial Belt Specialists Since 1911"

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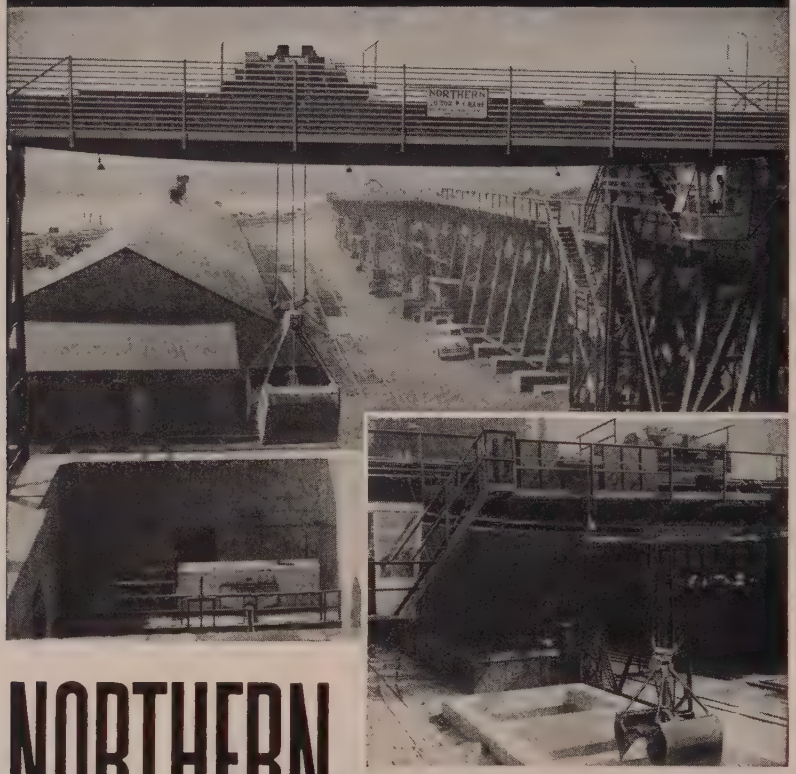
Adjustable to any length • Adaptable to any drive • Balanced power • Constant power • Vibrationless power

Look Overhead . . . see "NORTHERN"



NORTHERN YARD CRANES

are built for rugged service

All Northern Overhead Electric Traveling Cranes are designed and built to provide the maximum in dependable operation under the most rugged conditions.

High efficiency and minimum maintenance are assured by close tolerance machining of all mechanical parts with turned and ground shafts, press fits of gears, wheels and bearings. Brakes are chosen to allow for extreme overload conditions. Extra heavy structural sections and rigid construction of girders with end trucks insure lateral stiffness, minimum vertical deflection and safe operation when the crane travels at full speed. Heavy duty type motors with anti-friction bearings are combined with especially selected control equipment to assure fine handling.

In plants where bulk material handling is required, as in the steel plant shown above, Northern cranes are a preferred investment for safety, dependability and efficiency.

Write for Bulletin SE-108

MATERIAL HANDLING EQUIPMENT BY NORTHERN

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

two profile gages or two production parts at the same time.

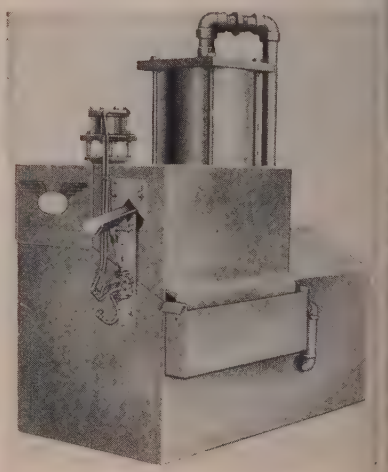
How it works: An easily made template, enlarged five times, has a parallelogram linkage to the twin toolholders.

A pair of diamond dressers keeps the wheels trued for accurate grinding. A cylindrical grinding attachment permits grinding of circular pieces up to 4 in. in diameter. *Write*: Carl Hirschmann Co. Inc., 30 Park Ave., Manhasset, N. Y. *Phone*: Manhasset 7-5300

Billet Descaler

A triple-nozzle water spray with 22 psi is used in this portable descaler. The self-contained unit needs only shop air for power.

The descaler is usually located



next to the hot forging press. Billets are inserted, and the water spray is released automatically. Production rate: 240 to 360 billets an hour for billets up to 6 in. in diameter. *Write*: Richards Co., 23828 Hollander, Dearborn, Mich. *Phone*: Logan 5-4471

Trim Press

This hydraulic press does stamping, swedging, staking and broaching. Its capacity is 20 tons with a 12-in. stroke.

The clear platen area is 18 x 24 in. There is a 15 x 15 in. cut-out in the bottom of the platen.

Both static air and hydraulic

STRUCTURAL STEEL PLACED

660 tons, approach work, Patapsco tunnel, contract TT-103, Baltimore, through Buckley & Co. Inc., Philadelphia, to Harris Structural Steel Co., New York.

000 tons, south wing, Riverside church, Riverside drive and 119th street, New York, to Harris Structural Steel Co., New York.

15 tons, four beam bridges, Spaulding turnpike, Dover, N. H., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through W. H. Hinman, Westbrook, Me.

000 tons, municipal high school for the printing trade, Manhattan, New York, to Lehigh Structural Steel Co., Allentown, Pa.

440 tons, five nose wing hangars, Elmendorf Air Base, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Baker-Ford Co., Bellingham, Wash., general contractor at $5,418,110.

050 tons, plant addition, West Virginia Pulp & Paper Co., Charleston, S. C., to Bristol Steel & Iron Works Inc., Bristol, Va.

00 tons, addition to pumping facili
ford Works, to Isaacson Iron W
tle; Morrison-Knudsen Co.
general contractor.

00 tons, manufacturing
house, R. T. French
to Easton Steel Str

15 tons, state bridg
A. B. Roth & Co

55 tons, four
Manchester,
Rolling M
through

80 tons,
bridge,
Co., Ca

85 tons
Corp.,
Structu
Buildi
contra

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Isaacso
Inc., S

90 tons,
Wilson

75 tons,
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Cambrid
Providen

50 tons, m
Wash., for
Co., to Jose

45 tons, garag
Cambridge, Mas
tural Co., Cambri

500 tons, 49 intake
power plant, St. Law
Manning, Maxwell &
Heights, Mich., schedul
Inc., New York, eight service
gates for Massena, N. Y., intake,
2; also schedule 3 covering the man
and delivery of equipment; bids Nov. 30
the New York State Power Authority.

180 tons, students union building, University of New Hampshire, Durham, N. H., to Groisser & Shlager Iron Works, Somerville, Mass.; J. A. Volpe Construction Co., Malden, Mass., general contractor.

100 tons, state school, Portland, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Consolidated Constructions Inc., Portland, Me., general contractor.

100 tons, superstructure, St. Lucie canal, Florida state turnpike, to Mount Vernon Bridge Co., Mt. Vernon, O.

800 tons, four buildings, International Business Machines Corp., Owego, N. Y., to Harris Structural Steel Co., New York.

610 tons, state highway bridges, Southeast expressway, Boston-Milton, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Savin Construction Co., East Hartford, Conn., general contractor (reported in STEEL, Nov. 21, as involving 1350 tons).

450 tons, 14-story apartment, 136 E. 55th St., New York, through Emery Roth & Sons, to Harris Structural Steel Co., that city.

1300 tons, office building, Connecticut Mutual Life Co., Hartford, Conn., to Harris St

3000 tons, office, 123 William St., New York, placed by Diesel Construction Co., with the Harris Structural Steel Co., New York.

2250 tons, 82 transmission towers, Public Service Electric & Gas Co., Bayway, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

534 tons, 4-story branch, First National Bank, Portland, Oreg., to Bethlehem Pacific Coast Steel Corp., Seattle.

275 tons, warehouse, Rexall Drug Co., Boston, to Groisser & Shlager Iron Works, Somerville, Mass.

220 tons, state bridge, Union county, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, Franklin National Bank building, Rockville Center, N. Y., through Niel Nielsen, general contractor, to Kurtz Iron Works, a Long Island, N. Y., fabricator.

150 tons, state bridge, Ulster county, N. Y., through the Pine Brook Construction Co. to the Klevin Engineering Co., New York.

375 tons, bleach plant

Amer
Cable Co
Steel Co.,

1300 tons, seve
necticut turnpi
to Schact Structu
D. V. Frione & Co.
general contractor; al
and 865 tons, reinforc

140 tons, plant, Blow
Lenoir, N. C., to Brid
Inc., Bristol, Va.

137 tons, Idaho state
bridge, to Bethleh
Corp., Seattle.

9000 tons, power plan
Edison Co., Astoria
ican Bridge Divis
Pittsburgh; also 20

9000 tons, power pla
Co., Staten Island,
Bridge Division, U
burgh; also 200 ton

6930 tons, ten grade
mile elevated viadu
303-01 and 304-01,
Kievens Corp., Yo

800 tons, municipal power plant, 74th St., New York, to Lehigh Structural Steel Co., Allentown, Pa.

450 tons, Boehm Junior High School, Falls Township, Pa., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

425 tons, school, Mackworth Island, Falmouth, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Consolidated Constructors Inc., Portland, Me., general contractor; 36 tons, reinforcing bars, to same shop.

5070 tons, office building, Union Dime Savings Bank, 6th Ave. and 40th St., New York, through George A. Fuller Co. to the Harris Structural Steel Co., New York.

4560 tons, reconstruction, DeKalb avenue subway station, sections 1 and 2, Brooklyn, N. Y., through Poirier & McLane Corp., general contractor, to Harris Structural Steel Co., New York.

1335 tons, seven grade crossings and Mill river bridge, Connecticut turnpike, Fairfield, Project 309-01, to Bethlehem Steel
m, Pa.; Poirier & McLane
general contractor.
dge, Berks county, Pa.,
F. C. Wagman, Dallas-
contractor, to Lehigh
lentown, Pa.
' No. 204, Queens,
l Steel Co., Al-

58, Brooklyn,
teel Co., Allen-

282, Brooklyn,
eel Co., Allen-

t Hartford,
, Machester,
c., Hartford,
reinforcing to

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to Bethlehem
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reinforcing

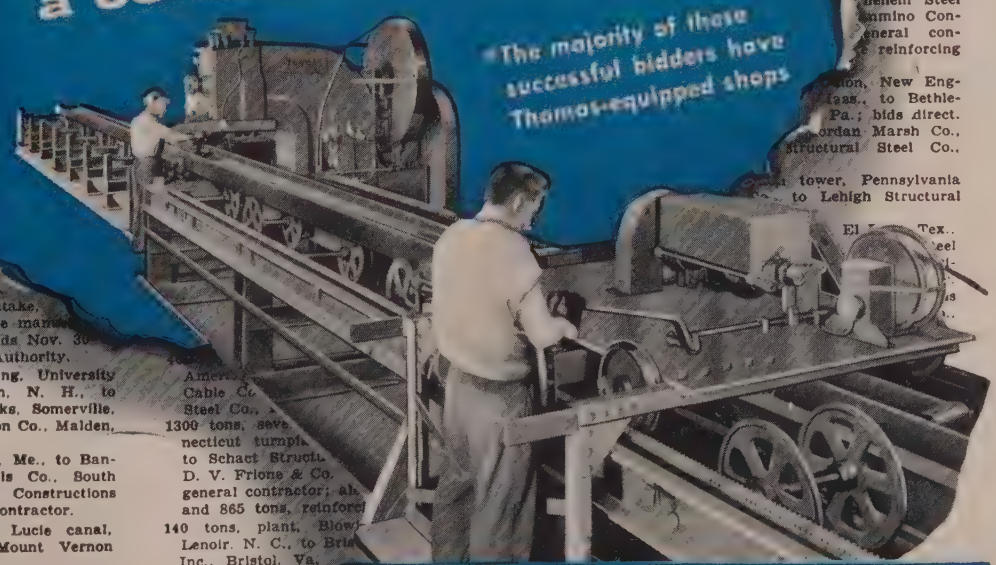
ion, New Eng-
ass., to Bethle-
Pa.; bids direct.
ordan Marsh Co.,
Structural Steel Co.,

tower, Pennsylvania
to Lehigh Structural

El Tex.,
eel

The trend is to THOMAS
for steel fabricating machinery that cuts costs in a competitive market*

*The majority of these successful bidders have Thomas-equipped shops



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Specify Nickeloid PRE-Plated Metals, in durable uniform finishes of chrome, nickel, copper or brass on base metals of steel, zinc, copper, brass or aluminum.

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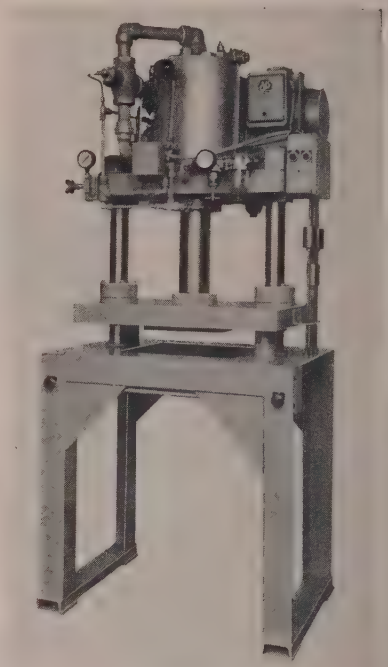
Sales offices in most principal cities

AMERICAN NICKELOID COMPANY
Peru 1, Illinois Mills: Peru, Ill. — Walnutport, Pa.

pressure are used; a 3-hp motor gives economical operation.

A speed control is available for adjustable, fast traverse speed



(600 ipm) and also for pressing speed (35 ipm). *Write*: Mohler Co., 3460 Glendale Blvd., Los Angeles 39, Calif. *Phone*: Normandie 5-5223

Aluminum Oxidation

A chrome sealer prevents the oxidation of aluminum when it is used in place of copper for electrical purposes in sheltered areas.

The aluminum is sealed with a film having a low resistance.

Work may be treated in batch processes or continuously by dip or spray. *Write*: Conversion Chemical Corp., Rockville, Conn.

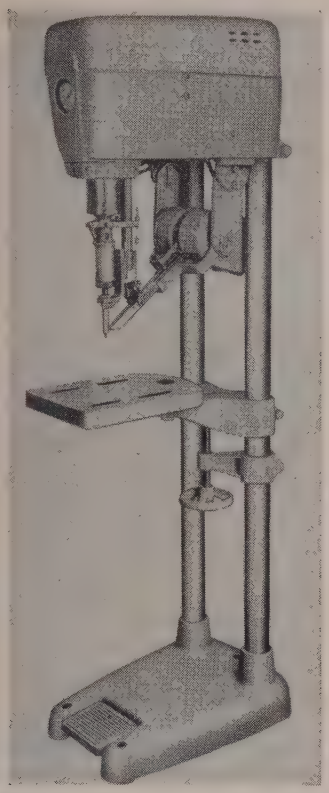
Power Screw Driver

In a fully automated setup, the power screw driver feeds, guides, controls the length of the stroke and maintains a predetermined torque.

Several machines can be set up to do multiple fastening jobs with one operator controlling the entire battery.

When the machine is run man-

ually, operator fatigue is reduced and efficiency is increased. The machine eliminates individual screw handling and protects the part from assembly damage.



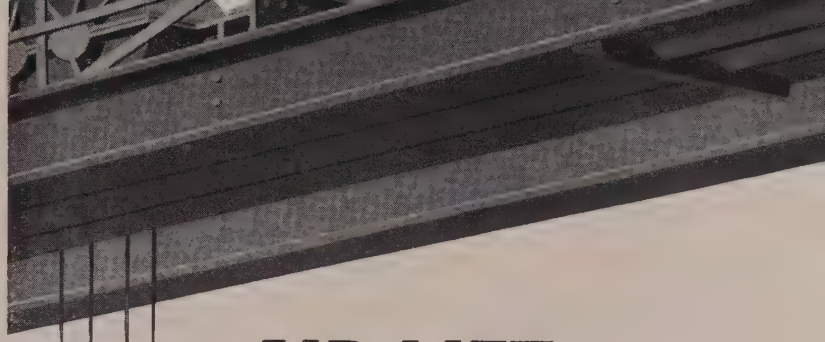
Work pieces can be handled quickly and placed accurately because the operator can use both hands.

Up to 60 screws can be driven in a minute. *Write*: Power Screw Driver Dept., Shakeproof Division, Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill. *Phone*: Capitol 7-2200

Industrial Trailer

A 128-in. trailer, in 38 and 48-in widths, has an 8000-lb capacity. Four-wheel steering assures perfect trailing.

The trailer is available with a steel-bound, oak platform or one made of checkered steel plate. *Write*: Yale Materials Handling Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. *Phone*: Orchard 3-1200



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CONCO ENGINEERING WORKS—Domestic Heating Equipment
CONCO BUILDING PRODUCTS, INC.—Brick, Tile, Stone

NEW literature

Write directly to the company for a copy

Nickel Plating

A 20-page instruction manual on bright nickel plating covers three techniques. A burnishing barrel and a dryer are described in a 2-page bulletin, MBD-100. Hanson-Van Winkle-Munning Co., Church St., Matawan, N. J.

Refractory Stack

An insulated stack for furnaces, ovens, retorts and incinerators where flue gas temperatures do not exceed 1600°F is described in bulletin IT-18, 4 pages. Van-Packer Corp., Bettendorf, Iowa.

Drum Gaging

A chart tells how to determine the amount of alcohol or solvent in a 55-gal drum by stick measurement. U. S. Industrial Chemicals Co., division of National Distillers Products Corp., 99 Park Ave., New York 16, N. Y.

Cast Iron Repair

Case histories show how welding electrodes are used to repair cast iron—4 pages. Readers Service Section, International Nickel Co. Inc., 67 Wall St., New York 5, N. Y.

Visible Grinding

A grinding method that lets the worker see through the wheel is described in a 4-page bulletin. Carl Hirschmann Co. Inc., 30 Park Ave., Manhasset, N. Y.

Tap Chart

Twelve tables give tap tolerances, drill sizes, speeds, lubricants, rake angles and terminology. Data on a line of taps is given in catalog 8, 25 pages. Wood & Spencer Co., 1930 E. 61st St., Cleveland 3, O.

Permanent Magnets

Information on selecting magnets is given in bulletin 5-R, 12 pages. Indiana Steel Products Co., Valparaiso, Ind.

Hoses

Low, medium and high-pressure hoses for air, water, fuel, lube and hydraulic uses and special hoses are covered—catalog 200, 64 pages. Aeroquip Corp., 300 S. East Ave., Jackson, Mich.

Self-Tapping Bushing

A 12-page bulletin describes a self-tapping insert that can be installed in a drilled or cored hole. Groov-Pin Corp., Ridgefield, N. J.

Industrial Control Systems

A static control system, Cypak, is discussed in bulletin B-6584. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

Rapid Reversing Motors

Construction of a motor capable of 200 idle reversals a minute is illustrated in bulletin 1800. Louis Allis Co., Milwaukee 7, Wis.

Speed Reducers

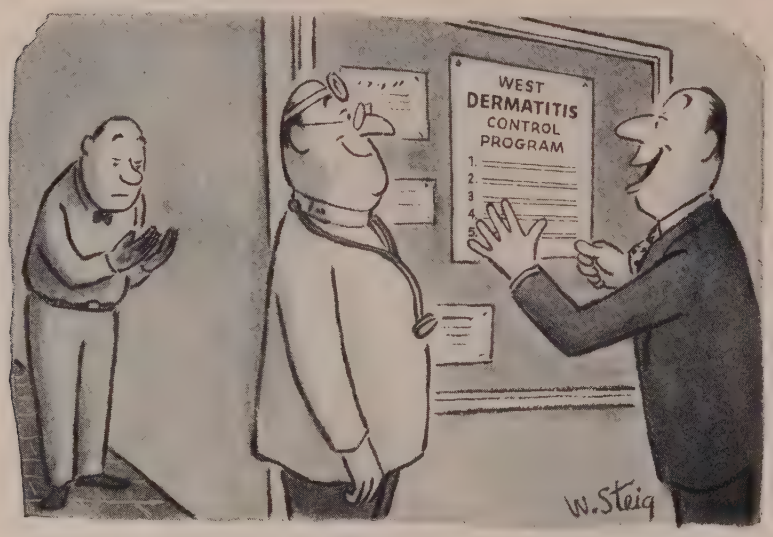
Data for selecting speed reducers are included in bulletin 450, 52 pages. Farrel-Birmingham Co. Inc., Ansonia, Conn.

Milling Machine

A 5-hp machine for milling small parts is described in bulletin C1-1, 8 pages. Sundstrand Machine Tool Co., 2531 11th St., Rockford, Ill.

Heat Transfer

Data for designers and users of custom-built heat transfer equip-



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An exaggeration?

Not at all. Occupational skin irritation can be prevented. Simply. At surprisingly little cost.

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1—insures personal cleanliness
2—protects exposed skin areas
3—prevents clothing contamination
4—guards against special hazards
5—provides continuous consultation.

Workers free of skin irritation can save you hundreds, perhaps thousands, of dollars each year—by eliminating the cost of:

—medical treatment
—enforced idleness
—absenteeism
—sacrificed quality
—lowered morale
—production lags.

The WEST Program for controlling skin irritations is based on individual shop requirements and an in-your-shop survey, made without obligation. Let a WEST representative plan the details.

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WEST DISINFECTING COMPANY
Dept. S, 42-16 West St.
Long Island City 1, N. Y.

In Canada: 5621-23 Casgrain Avenue, Montreal

ment are given in a 16-page bulletin, HE. Downingtown Iron Works Inc., Downingtown, Pa.

Corrugated Boxes

How to ship economically using corrugated boxes is told in a 24-page booklet. Hinde & Dauch Paper Co., Sandusky, O.

Stampings

Facilities for making stampings are described in bulletin Adv. 681, 16 pages. Pressed Steel Division, Republic Steel Corp., 6100 Truscon Ave., Cleveland 27, O.

Collets

A collet selection guide for lathes, millers, grinders and fixtures is presented in bulletin 56, 4 pages. Hardinge Brothers Inc., Elmira, N. Y.

Foundry Tools

Advantages of plastic patterns, match plates, core prints and core driers for dielectric baking are given in a 6-page bulletin. Marbelette Corp., 37-21 30th St., Long Island City 1, N. Y.

Tooling

Use of bushings for sheet metal and laminate plastic drill templates is given in a 20-page bulletin. Hi-Shear Rivet Tool Co., 8924 Bellanca Ave., Los Angeles 45, Calif.

Molybdenum Silicides

Refractory molybdenum silicides, their preparations, uses and properties are presented in bulletin Cdb-6, 8 pages. Fabrication techniques used to make molybdenum disilicide parts are given in bulletin CH-23, 2 pages. Dept. L, Climax Molybdenum Co., 500 Fifth Ave., New York 36, N. Y.

Vapor Spray Degreaser

Photographs and specifications of a degreaser that uses 30 per cent less solvent are given in bulletin OP2, 4 pages. Circo Equipment Co., 51 Terminal Ave., Clark (Rahway), N. J.

Brazing Aluminum

Shop data and complete brazing information for engineers and designers are included in a 134-page book. Aluminum Co. of America, 774 Alcoa Bldg., Pittsburgh 19, Pa.

Marking Dies

Press-style steel dies and their use are described in a 44-page bulletin. Jas. H. Matthews & Co. Inc., 3942 Forbes St., Pittsburgh 13, Pa.

Steels

A readily welded alloy steel, T-1, with a yield strength of 90,000 psi and over is described in a booklet. Carbon and alloy steels for pressure vessels are compared in a 12-page bulletin. Lukens Steel Co., Coatesville, Pa.

Belting Catalog

Information on power transmission and conveyor and elevator systems is presented in a 44-page catalog. C. R. Daniels Inc., Daniels, Md.

Belt Conveyor Idler

A ball bearing idler for belt widths from 14 to 36 in. is presented in bulletin 2516, 6 pages. Dept. PR., Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.

Carbon Dioxide Systems

Supply systems for the welding industry are described in a 4-page bulletin, ADPC-26. Pure Carbonic Co., division of Air Reduction Co. Inc., 60 E. 42nd St., New York 17, N. Y.

EFFECTIVELY HANDLES MORE VOLUME THAN ANY OTHER COUPLING OF EQUAL DIMENSIONS
HANDLES ANY JOB WITH FITTINGS FROM ¾" TO ⅛", FROM THE AIR LINE TO THE AIR TOOL
ONE-WAY SHUT-OFF

HANSEN Series 3-RL
RING-LOCK COUPLING

Smaller—lighter—compactly designed, the Hansen Series 3-RL Coupling *effectively* handles far more volume than any coupling of equal dimensions. On any job requiring ¾" to ⅛" connections—from the air line to the air tool—this single size Hansen Ring-Lock Coupling—with completely interchangeable Sockets and Plugs—does it all—makes it easy to keep stock of parts in balance—holds inventories to a minimum.

To connect, merely push Plug into Socket. To disconnect just turn the sleeve. Locking ring provides positive lock and assures tight fit. Sockets with aluminum bodies are available for use with small hand-operated air tools.

Write for Descriptive Literature

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THE HANSEN MANUFACTURING COMPANY
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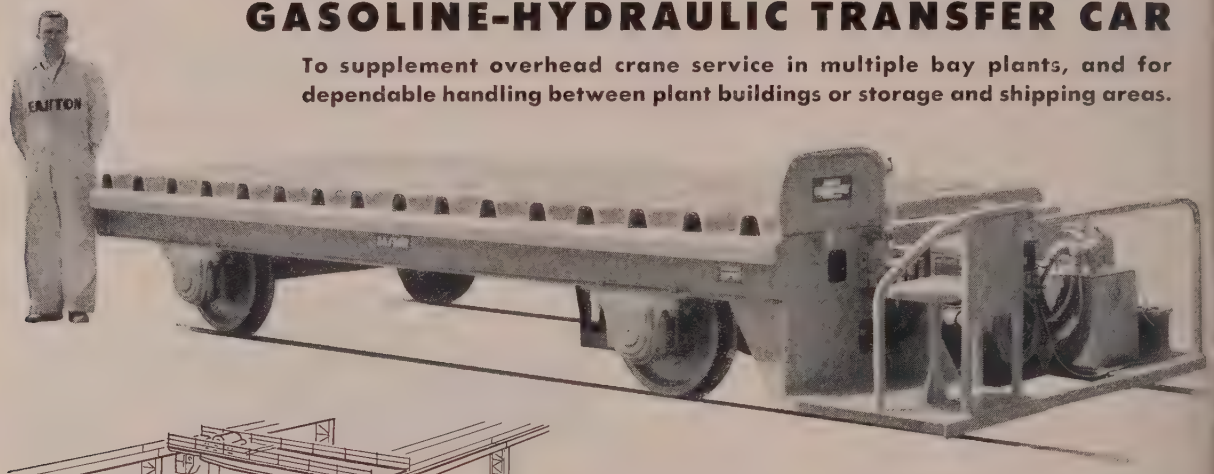
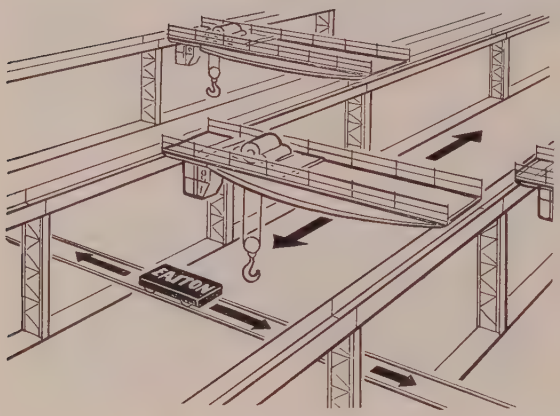
NEW CROSS-BAY®

GASOLINE-HYDRAULIC TRANSFER CAR

To supplement overhead crane service in multiple bay plants, and for dependable handling between plant buildings or storage and shipping areas.





EASTON CROSS-BAY CARS are custom-built to meet speed and capacity requirements. Special superstructures can be designed for specialized or mechanized handling. The gasoline-hydraulic Cross-Bay Car illustrated above was built for steel warehouse work. It provides a capacity of 25 tons plus 50% for impact loading, and a two-way speed of 50 feet per minute.

In addition to the gasoline-hydraulic car shown above Easton Cross-Bay Cars may be powered by electric motor, electro-fluid drive, gasoline-electric drive or storage battery. Capacities from 5 to 500 tons. Controls may be manual, electric (by push-button on the car or remote station) or electronic.

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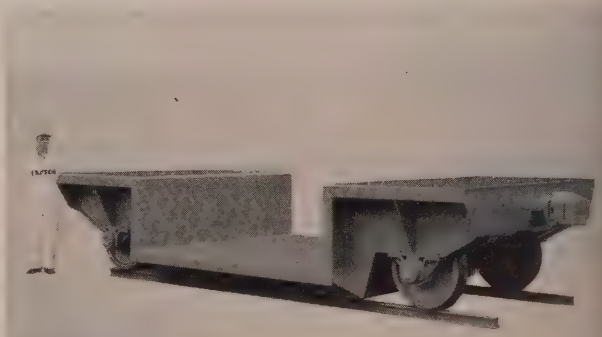
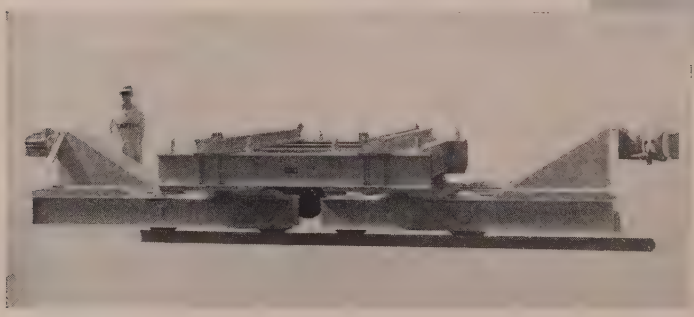
Annealing Furnace Car Equipped with Rack Beam ▲





▲ Split-level Platform Car—Capacity 50 tons

◀ Double-truck Transformer Transfer Car —Capacity 150 tons

A-1049

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STEEL

March 5, 1956

Market Outlook

SPECULATION about the probable impact which wage negotiations will have on steel demand and prices is mounting. Everyone, it appears, expects a substantial price hike if the union's demands are met next quarter.

Management, of course, doesn't know what the steelworkers will ask for. For that matter, it's doubtful if the union leaders themselves know now what their complete contract package will be. They're scheduled to meet in Chicago next week to survey the situation with a view to developing policy ideas. Formalization of their demands will come later.

STIFF DEMANDS—Management expects some pretty stiff demands, based on union leaders' statements and trade speculation over recent months. Union proposals are thought likely to include: A guaranteed annual wage, an hourly wage increase and premium rates for Saturday and Sunday work.

Any one of those provisions would send steel costs up. Until management knows what the union will ask for in full, any suggestion as to how much prices will rise this summer can be no more than a wild guess. All that can be said with any degree of certainty is that prices will quickly reflect any increase in labor costs.

WORK STOPPAGE—Whether there will be a strike also is a matter that rests in the lap of developments. There is no way of determining at this stage whether either side is in such fighting mood that it is ready to walk right into a work stoppage.

Steelmakers, of course, are likely to resist unduly stiff and unreasonable demands. It doesn't necessarily follow that an amicable settlement of the issues can't be worked out. Considering some previous conciliatory statements of union leadership, there is at least a 50-50 chance that a strike will be averted.

DEMAND STIMULATED—Uncertainty is stimulating some protective buying. Some consumers are ordering a little more tonnage than might be the case were the outlook clearer.

Further easing in pressure for steel shipments continues. This is mostly noticeable in sheets and bars, principally on automotive account. Auto production still is declining. Latest weekly figure shows passenger car output of 124,317, against 128,236 the week preceding.

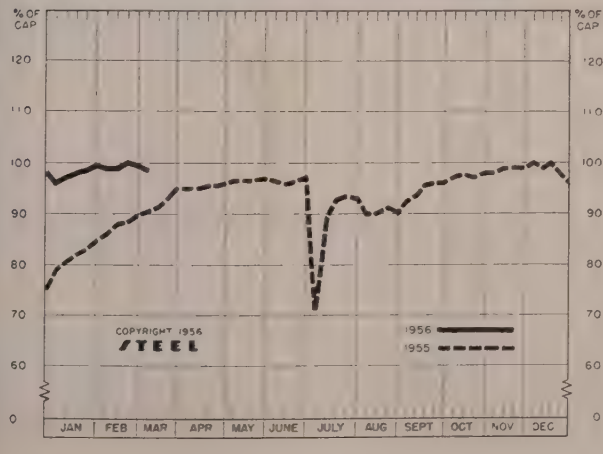
ARREARAGES—Despite the easing in automotive requirements, over-all demand appears as strong as ever. Greatest pressure is in plates, structural shapes and seamless pipe. Tin plate demand also is extremely strong. Requirements for hot-rolled bars are off from last year's peak, but demand still exceeds supply.

Producers will enter second quarter with substantial arrearages in all the major products, including sheets and strip.

PRICES—Scrap prices continue to slide. STEEL's composite on steelmaking grades last week eased to $48.33 from $49. The decline has amounted to $5 per ton over the last month. The finished steel composite is unchanged at $128.02. Pig iron prices are steady also.

PRODUCTION—The steel mills lowered ingot operations 1 point last week to 98.5 per cent of capacity. Part of the curtailment was due to furnace repairs.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Mar. 4	Change	Same Week 1955	Same Week 1954
Pittsburgh	101	— 2.5*	90.5	81.5
Chicago	99	0*	95	79.5
Mid-Atlantic	100	— 1	87	69
Youngstown	97	— 3	92	70
Wheeling	97	— 2.5	96	82
Cleveland	101.5	— 2*	95.5	66
Buffalo	105	0	100	63.5
Birmingham	95	0	86.5	80
New England	75	0	80	65
Cincinnati	97	0	85.5	72.5
St. Louis	106	0	96	43.5
Detroit	102	— 0.5	88	63.5
Western	108	0	94	80.5
National Rate	98.5	— 1	90.5	70

INGOT PRODUCTION‡

	Week Ended Mar. 4	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	150.8†	151.5	152.1	138.1
NET TONS (In thousands)	2,422†	2,433	2,444	2,218

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954.

Metalworking Outlook—p. 45

Technical Outlook—p. 91

Price Indexes and Composites

FINISHED STEEL, Price Index (Bureau of Labor Statistics)

	Feb. 28 1956	Feb. 21 1956	Month Ago	Feb. Average
(1947-1949=100)	157.1	157.1	157.0	157.1

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Feb. 28

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.175
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	8.243
Tie Plates	5.625	Strip, C.R., Stainless, 403 (lb)	0.444
Axles, Railway	8.350	Strip, H.R., Carbon	5.606
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.997
Plates, Carbon	5.200	Pipe, Galv., Buttweld (100 ft)	21.137
Structural Shapes	4.867	Pipe, Line (100 ft)	167.250
Bars, Tool Steel, Carbon (lb)	0.460	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Casing, Oil Well, Alloy (100 ft)	244.670
Bars, Tool Steel, H. R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	Tubes, Boiler (100 ft)	39.470
Bars, Tool Steel, H.R., Alloy, High Speed W-18, Cr 4, V 1 (lb)	1.680	Tubing, Mechanical, Carbon	20.980
Bars, H.R., Alloy	9.425	Tubing, Mechanical Stainless, 304 (100 ft)	178.897
Bars, H.R., Stainless, 303 (lb)	0.450	Tin Plate, Hot-dipped, 1.25 lb	8.933
Bars, H.R., Carbon	5.500	Tin Plate, Electrolytic, 0.25 lb	7.633
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	6.733
Bars, C.F., Carbon	8.800	Wire Drawn, Carbon	8.575
Bars, C.F., Alloy	12.275	Wire, Drawn, Stainless 430 (lb)	0.590
Bars, C.F., Stainless, 302 (lb)	0.475	Bale ties (bundle)	6.473
Sheets, H.R., Carbon	5.345	Nails, Wire, 8d Common	8.595
Sheets, C.R., Carbon	6.214	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.770	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	Feb. 29 1956	Week Ago	Month Ago	Year Ago	5-Yrs. Ago
Index (1935-39 av.=100)	209.10	209.10	209.10	194.53	171.92
Index in cents per lb	5.665	5.665	5.665	5.270	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$128.02†	$128.02†	$128.02†	$117.82	$106.32
No. 2 Fdry. Pig Iron, GT	58.99	58.99	58.99	56.54	52.54
Basic Pig Iron, GT	58.49	58.49	58.49	56.04	52.16
Malleable Pig Iron, GT	59.77	59.77	59.77	57.27	53.27
Steelmaking Scrap, GT	48.17	48.33	50.50	37.33	44.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.
†Revised

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Feb. 29 1956	Week Ago	Month Ago	Year Ago	5-Yrs Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.70
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.70
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	4.18
Bars, C.F., Pittsburgh	6.25*	6.25*	6.25*	5.40	4.55
Shapes, Std., Pittsburgh	4.60	4.60	4.60	4.25	3.65
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.65
Shapes, deld., Philadelphia	4.88	4.88	4.88	4.53	3.90
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.70
Plates, Chicago	4.50	4.50	4.50	4.225	3.70
Plates, Coatesville,Pa.	4.80	4.80	4.80	4.225	4.15
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.70
Plates, Claymont, Del.	4.80	4.80	4.80	4.225	4.15
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.60-3.7
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.60
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.55
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	4.80
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.75-4.0
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.50
Strip, C.R., Pittsburgh	6.25	6.25	6.25	5.75	4.65-5.3
Strip, C.R., Chicago	6.25-6.35	6.25-6.35	6.25-6.35	5.85	4.90
Strip, C.R., Detroit	6.35	6.35	6.35	5.90	4.35-5.6
Wire, Basic, Pittsburgh	6.60	6.60	6.60	5.75	4.85-5.1
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.90-6.2
Tin plate (1.50 lb), box, Pitts.	$9.45	$9.45	$9.45	$9.05	$8.70

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$66.0
Wire rods, 7/32-5/8" Pitts.	5.375	5.375	5.375	4.675	4.10-4.3
PIG IRON, Gross Ton					
Bessemer, Pitts.	$59.50	$59.50	$59.50	$57.00	$53.00
Basic, Valley	58.50	58.50	58.50	56.00	52.00
Basic, deld. Phila.	62.16	62.16	62.16	59.66	56.39
No. 2 Fdry, Pitts.	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, Chicago	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, Valley	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, deld. Phila.	62.66	62.66	62.66	55.16	56.89
No. 2 Fdry, Birm.	55.00	55.00	55.00	52.88	48.88
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.58	55.58
Malleable, Valley	59.00	59.00	59.00	56.50	52.50
Malleable, Chicago	59.00	59.00	59.00	56.50	52.50
Ferromanganese, Duquesne	205.00†	205.00†	205.00†	190.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$47.50	$47.50	$49.50	$38.50	$45.00
No. 1 Heavy Melt, E. Pa.	50.00	50.50	53.00	39.50	43.50
No. 1 Heavy Melt, Chicago	47.00	47.00	49.00	34.00	43.50
No. 1 Heavy Melt, Valley	52.50	52.50	54.50	37.50	45.00
No. 1 Heavy Melt, Cleve.	49.50	49.50	52.00	34.00	44.00
No. 1 Heavy Melt, Buffalo	46.50	46.50	47.50	32.50	44.00
Rails, Rerolling, Chicago	65.50	66.50	69.00	49.50	52.50
No. 1 Cast, Chicago	46.50	46.50	48.50	40.00	49.00

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.125	$14.125	$14.125	$13.75	$14.75
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	17.50
Oven, Fdry, Chicago	27.00	27.00	27.00	24.50	21.00

Daily Nonferrous Price Record

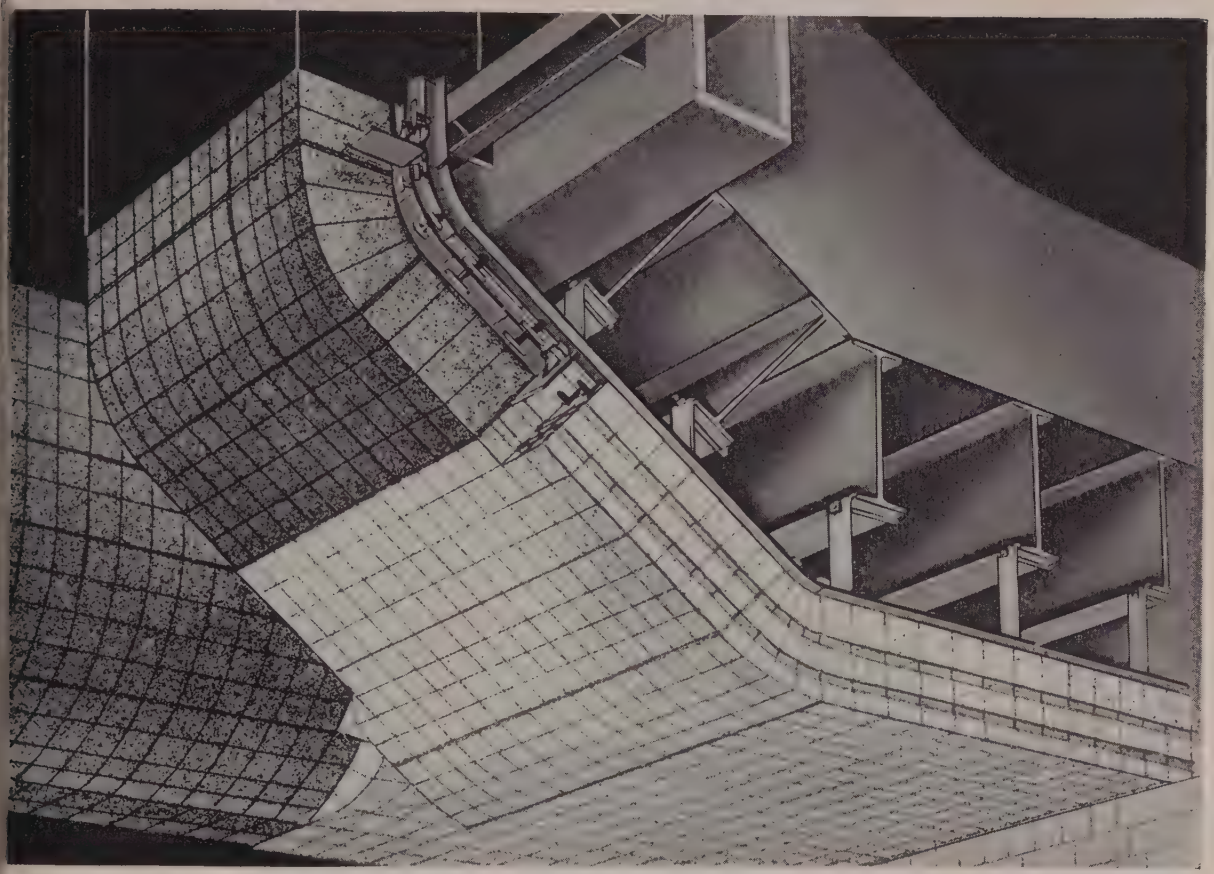
	Price Feb. 29	Last Change	Previous Price	Feb. Avg.	Jan. Avg.	Mar. 1955 Avg.
Copper	46.00–53.00	Feb. 23, 1956	46.00–52.00	48.076	46.700	33.222
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.960	14.800
Zinc	13.50	Jan. 6, 1956	13.00	13.500	13.440	11.500
Tin	101.75	Feb. 29, 1956	102.125	100.908	105.067	91.176
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	64.500
Aluminum	24.40	Aug. 8, 1955	23.20–24.40	24.400	24.400	23.200
Magnesium	32.50	Aug. 16, 1955	28.50	32.500	32.500	27.556

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

New trends in the use of refractories



LACLEDE-CHRISTY develops new arch for metallurgical furnaces

This new furnace arch design saves installation time, saves money and features adaptability never before achieved with refractory arch construction.

The Laclede interchangeable type arch proved its money and time-saving value by more than one year heavy duty steel mill service. Service records show from 850 to 1000-heat campaigns. It is particularly suited for fantail and chill arches in open hearth furnaces, and heating zone arches in reheating furnaces as well as copper reverberatory furnace arches.

Basic tile or clay tile may be hung interchangeably on the supporting structure, as service experience requires. The design permits adequate expansion of tile during heating up and continued furnace service. Minimum number of tile shapes are required.

Lug castings engage the tile on the bed joints, allowing easy installation. Heavy shelf castings prevent cumulative overload.

Money-saving performance can be expected when this interchangeable type arch is built with Laclede's Peerlac refractory (60% alumina) in 12 in. and 15 in. depths, and with basic refractory steel encased. Supporting structure of steel weldments and small heat-resisting castings are also available for prompt shipment.

This example of Laclede advancements in refractory service demonstrates one more point: it pays to make Laclede-Christy your first refractory source.

LACLEDE-CHRISTY COMPANY DIVISION

LACLEDE-CHRISTY COMPANY — FOUNDED 1844 — Quality First

DIVISION OF H. K. PORTER COMPANY, INC. — HKP

H. K. PORTER COMPANY, INC.
2000 Hampton Ave. · St. Louis 10, Missouri
Mission 7-2400

Nonferrous Metals

The government's Cuban nickel facilities move toward maturity. National Lead Co. leases a Philadelphia plant to produce 14 million lb of metallic nickel annually

Nonferrous Metal Prices, Pages 144 & 145

THE GOVERNMENT'S Nicaro nickel project has had more than its share of headlines. Congressmen, in a political year, have proclaimed graft, mismanagement, illegal use of funds.

Here are some of the little-printed facts: Nickel production has risen from 17.8 million lb in 1952 to 30.3 million lb in 1955. During the seven-month period from July 1, 1955, to Jan. 31, 1956, production exceeded an annual rate of 31 million lb. Unit production costs have been reduced, and the average recovery of nickel from ore has been materially improved during each calendar year. But, most important, the end product, originally produced as a finely powdered nickel oxide, is almost entirely converted to a sintered nickel oxide of higher nickel content.

For Sale—Nevertheless, the government wants out of the nickel business. On the eve of leaving the General Services Administration, Edmund F. Mansure, recently resigned administrator, stated that the agency "is firmly committed to make every possible effort to dispose of this (Nicaro) plant to private industry by sale or lease as soon as there is a possibility of getting a fair price."

The price question will be up in the air until present expansion work is completed and in operation long enough to compile cost figures. The program (berated by congressmen) is past the halfway mark and should be completed this fall. Capacity then will be about 50 million lb, or about 75 per cent over present capacity. Mr. Mansure estimated that the expansion will mean an increase in the market value of Nicaro's production from $18 million to $30 million.

Scoop — Apparently waiting for some of the clamor to die down, the General Services Administration has failed to announce that National Lead Co., with GSA guarantees, signed a contract (Feb. 1) to lease a Philadelphia plant to produce metallic nickel. After modifications and some revamping of equipment, the former stainless steelmaking facility will produce some 14 million lb of nickel ingot annually.

Meanwhile, nickel men are shaking their heads. They lament that it is rumored that the government take for military needs will be the largest on record. And the rumor persists that nickel is due for a price hike. Many will argue (including nickel producers) that there is nothing to be gained.

STEEL's Metal Price Averages for Feb., 1956

(Cents per lb)

Electrolytic Copper, deld. Connecticut	48.076
Lead, St. Louis	15.800
Prime Western Zinc, E. St. Louis, Ill.	13.500
Straits Tin, New York	100.908
Primary Aluminum Ingots, deld.	24.400
Magnesium, Freeport, Tex.	32.500
Nickel, f.o.b. refinery	64.500

Tin Strike Threatens

Malayan tin miners have never gone out on strike, but new unions, promising better wages (and seeking new members) threatened to strike on Feb. 25. A meeting with the Malayan Mining Employers Association postponed a strike decision until Mar. 3. Early last week London tin prices soared as sellers went into the tight market to cover commitments. There is a growing feeling that the Malayan miners will follow their historical pattern and continue working. Followers of the tin market are hoping that this will be the last world disturbance to touch off a market skyrocket. (London price is about $1.10 per pound.) They point out that if the Texas City smelter goes out of operation in June, it will make tin available for the long-sought buffer organization (International Tin Agreement).

Aluminum Roundup

The Justice department's motion to keep Aluminum Co. of America under court jurisdiction (STEEL, Feb. 6, p. 77) will not be heard by the court until early April. The Justice department contends that there is insufficient competition in the aluminum industry. Year-end statements continue to refute this point. Reynolds Metals Co. reports that it made the highest net profit in the history of the company during '55. Comparison: $34.3 million in 1955, $20.3 million in 1954.

Bridgeport Brass Co. (a major producer of brass, copper and aluminum mill products) and Hunter Douglas Aluminum Co. will merge. Hunter Douglas has facilities for producing aluminum strip, cold extrusions and impact forgings. It operates two plants, employing 1500 persons.

And the Office of Defense Mobilization reports that domestic primary aluminum producers are being notified that the call issued in September, 1955, for delivery to the government of 25,000 tons of aluminum is being reduced to 11,000 tons. The metal was scheduled for delivery Apr. 30, 1956. ODM explains that the 14,000 tons can be released due to expansion programs, which will provide greater quantities for emergencies. Question: Will military requirements take it all?

Lead, Zinc Demand Levels

Lead and zinc continue in satisfactory demand. The General Services Administration entered the market for both last week. While GSA will receive only token offers, the government's interest will keep prices firm. Rising prices on the London Metal Exchange will have little effect on U. S. prices. Reason: Automotive cutbacks will deter any thought of price hikes until May or June.

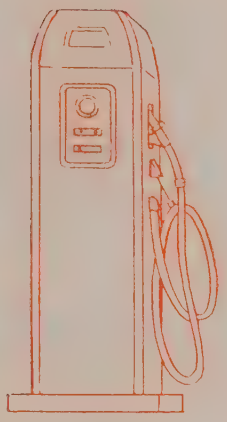
Copper: Continuing Crisis

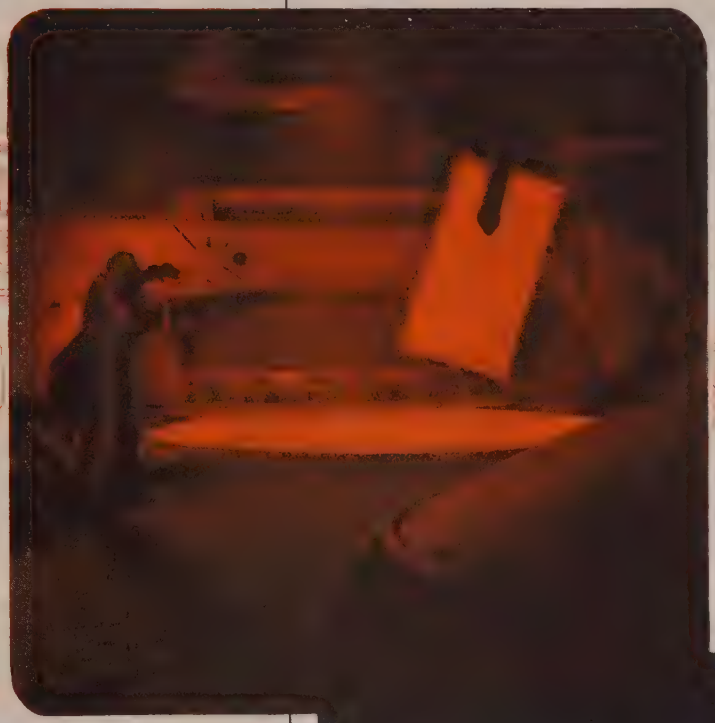
Chile's Finance Minister Oscar Herrera has done it again. On Feb. 27 he requested that the U. S. raise its price of copper from 46 to 48 cents per pound.

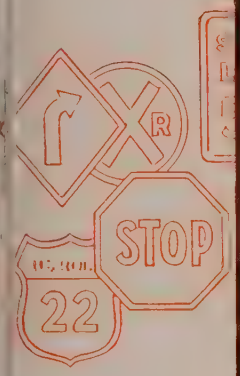
While his request may have been based on the fact that the Rhodesian Selection Trust Group jumped its price to a little above 48 cents per pound, it may be primarily a political move by Chile's economic leader. He is undoubtedly taking credit for forcing the price from 43 to 46 cents per pound (see STEEL, Feb. 27, p. 156) and may feel that he is second guessing when domestic producers are planning to raise prices again.

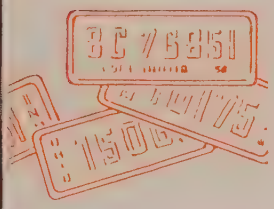
Newport Steel

KEEPS CARS ON THE ROAD



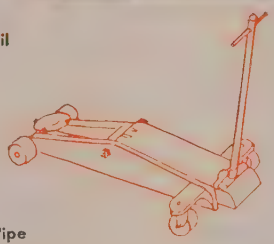






PRODUCTS OF NEWPORT STEEL

- Cold-Rolled Sheets
- Hot-Rolled Steel in Coil
- Hot-Rolled Pickled Steel in Coil
- Hot-Rolled Sheets
- Hot-Rolled Pickled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Florbond Sheets
- Electrical Sheets
- Alloy Sheets and Plates
- Electric Weld Line Pipe
- Roofing and Siding
- Pipe Trough and Conductor Pipe
- Culverts



ECONOMICAL WATERRAIL-TRUCK DELIVERY

Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads and 143 motor carriers enable Newport to give economical, dependable delivery to the entire area of the Middle West and South.

Newport Steel rolls products for countless end uses, servicing sixty million vehicles on the nation's highways. Just as they contribute to the safety, speed and convenience of motor travel, so Newport products play a singular role in the manufacture of other essentials in modern living. Here is an organization old in experience, diligent in operations and conscientious in delivery to precise specification. Combined with modern equipment and convenient location in the heart of America's greatest industrial growth, these factors make Newport Steel an outstanding source for all the products listed here.

Newport Steel

CORPORATION

NEWPORT, KENTUCKY

YOUR CONFIDENCE IS JUSTIFIED WHERE THIS FLAG FLIES

A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots, 24.40; pigs 22.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 26.20; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.20; No. 195, 4.5% Cu, 0.8% Si, 27.60; No. 214, 3.8% Mg, 27.80; No. 356, 7% Si, 0.3% Mg, 26.20.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 46.00 deld. Conn. Valley; 46.00 deld. Midwest; custom smelters, 53.00 deld.; Lake, 46.00 deld.; Fire refined, 45.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 99+, cups or ingots, $11.50; rod $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 32.50 f.o.b. Velasco, Tex.; ingot, 33.25 f.o.b. Velasco, Tex.

Magnesium Alloys: AZ91B (diecasting), 31.00 deld.; AZ63A, AZ92A, AZ91C (sand casting), 36.00 f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $268-$271 per 76-lb flask.

Molybdenum: Powder, 99% hydrogen reduced, $3.20 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom. per troy oz.

Palladium: $23-$24 per troy oz.

Platinum: $97-$112 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$53 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 90.75 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 101.75; prompt, 101.50.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.45; grade A-2 (0.5% Fe max), $3.15 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.50 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, $5.00. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.85; special high grade, 15.25 deld. Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $7.50-$10.00 per lb, depending on quantity; reactor grade, $14.00-$22.00 per lb, depending on quantity. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 30.25-32.75; No. 12 foundry alloy (No. 2 grade), 29.00; 5% silicon alloy, 0.60 Cu max, 30.50-31.25; 13 alloy, 0.60 Cu max, 30.50-31.25; 195 alloy, 30.50-31.25; 108 alloy, 29.00-29.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 29.75-30.25; grade 2, 28.75; grade 3, 28.00; grade 4, 27.50-28.50.

Brass Ingot: Red brass, No. 115, 44.00; tin bronze, No. 225, 58.00; No. 245, 50.75; high-leaded tin bronze, No. 305, 47.75; No. 1 yellow, No. 405, 34.75; manganese bronze, No. 421, 39.25.

Magnesium Alloy Ingot: AZ63A, 34.00; AZ91B, 34.00; AZ91C, 34.00; AZ92A, 34.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.84; rod, bar, wire, $1.81.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 51.355; l.c.l., 51.98. Weatherproof, 30,000-lb lots, 48.28; l.c.l., 49.03. Magnetic wire deld., 15,000 lb or more, 58.68; l.c.l., 59.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $13.10-$13.60; sheared mill plate, $10.50-$12.00; strip, $13.10-$13.60; wire, $9.50-$11.50; forging billets, $7.90-$8.15; hot-rolled and forged bars, $7.90-$8.15.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00-24.00; ribbon zinc in coils, 21.50; plates, 20.00-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	102	83	99
Strip, C.R.	102	92	125
Plate, H.R.	97	87	95
Rod, Shapes, H.R.	87	74	93
Seamless Tubes	122	110	153
Shot, Blocks	...	71	...

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	67.9	66.4	...	...
0.156-0.172	57.5	55.9	...	...
0.188	57.5	55.9	...	71.7
0.219-0.234	54.5	52.9	...	...
0.250-0.281	54.5	52.9	...	68.4
0.313	54.5	52.9	...	65.2
Cold-finished				
0.375-0.547	53.4	51.4	63.7	61.3
0.563-0.688	53.4	51.4	60.6	57.5
0.750-1.000	52.1	50.1	55.4	54.2
1.063	52.1	50.1	...	52.3
1.125-1.500	50.1	48.2	53.6	52.3
Rolled				
1.563	48.8	46.9	...	...
1.625-2.000	48.2	46.2	...	50.5
2.125-2.500	47.0	45.0	...	...
2.563-3.375	45.6	43.6	...	...

ALUMINUM

Sheet and Circle: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	37.5	42.3	...	...
0.135-0.096	38.0	43.2	...	...
0.095-0.077	38.7	44.2	36.1	41.1
0.076-0.061	39.3	45.1	36.3	41.4
0.060-0.048	39.9	45.6	36.7	42.2
0.047-0.038	40.4	46.5	37.2	42.8
0.037-0.030	40.8	47.0	37.6	43.3
0.029-0.024	41.4	47.5	37.9	43.8
0.023-0.019	42.2	49.0	38.8	44.8
0.018-0.017	43.0	...	39.4	45.5
0.016-0.015	43.9	...	40.2	46.4
0.014	44.9	...	41.2	47.5
0.013-0.012	46.1	...	41.9	48.4
0.011	47.1	...	43.1	50.0
0.010-0.0095	48.4	...	44.3	52.0
0.009-0.0085	49.7	...	45.8	54.0
0.008-0.0075	51.3	...	47.0	56.0
0.007	52.8	...	48.5	58.0
0.006	54.4	...	49.9	63.0

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	36.5	40.8
5050-F	37.6	41.9
3004-F	38.6	43.8
5052-F	39.9	45.2
6061-T6	41.1	46.0
2024-T4*	43.6	49.9
7075-T6*	51.4	58.5

*24-48 in. widths or diam, 72-180 lengths.

ALUMINUM

Forging Stock: Round, Class 1, 39.10-50.1 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 43.00-56.20 in random lengths, 0.375-4 in. thick x width 0.750-10 in.

Pipe: ASA Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$16.85	2	$ 51.95
1	26.50	4	143.00
1¼	35.85	6	256.70
1½	42.90	8	386.30

MAGNESIUM

Sheet and Plate: AZ31A standard grade, .032 in., 99.00; .064 in., 78.00; .125 in., 63.50; .250-2.0 in., 61.00. AZ31A special grade, .032 in., 145.00; .064 in., 100.00; .125 in., 83.00; .250-2.0 in., 79.00. Tread plate, .125 in., 68.00; .250-3.0 in., 64.00. Tooling plate, .250-3.0 in., 65.00.

Extrusions	Com. Grade (FS)	Spec. Grade (AZ31B)
1 in. diam. rod	61.50	73.00
Shapes: 0.3 lb/ft	65.40-72.40	76.90-83.90
1.0 lb/ft	61.90-67.30	73.40-78.80
4.0 lb/ft	57.70-62.20	69.20-73.70
2 in. OD x ⅛ in. w. tubing	74.50	86.00

NONFERROUS SCRAP

DEALERS BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 20.00-20.50; old sheets, 17.00-17.50; borings and turnings, 11.00-11.50; crankcases, 17.00-17.50; industrial castings, 17.00-17.50.

Copper and Brass: No. 1 heavy copper and wire, 44.00; No. 2 heavy copper and wire, 40.00; light copper, 37.00-37.50; No. 1 composition red brass, 32.00-32.50; No. 1 composition turnings, 31.00-31.50; yellow brass

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	67.13b	64.36c	....	67.32	42.000	42.000	41.250
Yellow Brass	55.60	45.65d	56.14	58.51	31.250	31.000	29.000
Low Brass, 80%	60.15	60.09	60.69	62.96	35.375	35.125	34.625
Red Brass, 85%	61.79	61.73	62.33	64.60	37.000	36.750	36.250
Com. Bronze, 90%	63.98	63.92	64.52	66.54	38.500	38.250	37.750
Manganese Bronze	62.64–62.75	56.65–56.74	67.09	....	29.250	29.000	28.500
Muntz Metal	56.94	52.75	....	....	29.125	28.875	28.375
Naval Brass	58.90	53.21	65.96	62.06	29.000	28.750	28.250
Silicon Bronze	70.48	69.67	70.52	72.66e	40.750	40.500	39.750
Nickel Silver, 10%	69.20	71.53g	51.53	....	34.625	34.375	17.313
Phos. Bronze, A, 5%	85.37	85.87	85.87	87.05	42.625	42.375	41.375

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

turnings, 17.50-18.00; new brass clippings, 27.50-28.00; light brass, 19.50-20.00; heavy yellow brass, 22.00-22.50; new brass rod ends, 26.00-26.50; auto radiators, unsweated, 24.50-25.00; cocks and faucets, 25.00-25.50; brass pipe, 25.50-26.00.

Lead: Heavy, 12.75-13.00; battery plates, 6.50-6.75; linotype and stereotype, 14.00-14.50; electrotype, 13.25-13.75; mixed babbitt, 15.50.

Magnesium: Clippings, 18.50-19.50; clean castings, 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings, 60.00-65.00; old sheets, 55.00-65.00; turnings, 50.00; rods, 60.00-65.00.

Nickel: Sheets and clips, 100.00-150.00; rolled anodes, 100.00-150.00; turnings, 85.00-125.00; rod ends, 100.00-150.00.

Zinc: Old zinc, 6.00-6.50; new die-cast scrap, 6.00; old die-cast scrap, 3.50.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 22.25-22.50; 3003 clippings, 22.00-22.50; 6151 clippings, 21.75-22.25; 5052 clippings, 21.75-22.25; 2014 clippings, 21.75; 2017 clippings, 21.50-21.75; 2024 clippings, 21.50-21.75; mixed clippings, 21.00-22.00; old sheet, 19.50-20.00; old cast, 19.50-20.00, clean old cable (free of steel), 21.75-22.25; borings and turnings, 19.50-20.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 68.00; light scrap, 63.00; turnings and borings, 48.00.

Copper and Brass: No. 1 heavy copper and wire, 45.00; No. 2 heavy copper and wire, 43.50; light copper, 42.00; refinery brass (60% copper) per dry copper content, 39.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 45.00; No. 2 heavy copper and wire, 43.50; light copper, 42.00; No. 1 composition borings, 35.50; No. 1 composition solids, 36.00; heavy yellow brass solids, 26.00; yellow brass turnings, 25.00; radiators, 27.50-28.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 63.79; oval, 62.92, 5000-10,000 lb; electrodeposited, 61.25, 2000-5000 lb lots; cast, 58.85, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery, effective Jan. 1, 1955.

Tin: Bar or slab; less than 200 lb, $1.205; 200-499 lb, $1.190; 500-999 lb, $1.185; 1000 lb or more, $1.180.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 85.50; 1000 lb, 81.50.

Copper Sulphate: 500-1900 lb, 17.90; 2000-5900 lb, 15.90; 6000 lb or more, 15.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 3300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 86.875; 16-oz bottle, 85.625; 80-oz bottle, 83.125; 100-oz bottle, 83.125; f.o.b. St. Louis, New York and Los Angeles. Effective Sept. 30, 1955.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb, and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 72.30; 100-600 lb, 63.80; 700-1900 lb, 61.30; 2000-9900 lb, 59.80; 10,000 lb or more, 58.40.

Stannous Chloride (anhydrous): Less than 25 lb, $1.696; 25 lb, $1.346; 100 lb, $1.196; 400 lb, $1.171; 5200-19,600 lb, $1.049; 20,000 lb or more, 92.70.

Stannous Sulphate: Less than 50 lb, $1.322; 50 lb, $1.022; 100-1900 lb, $1.002; 2000 lb or more, 98.20.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

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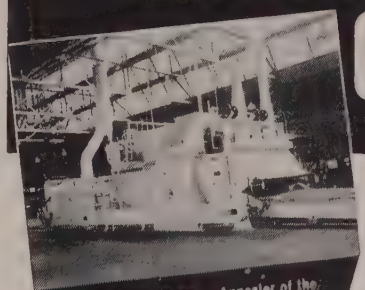
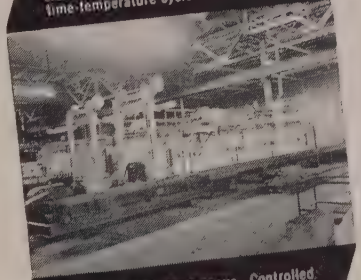
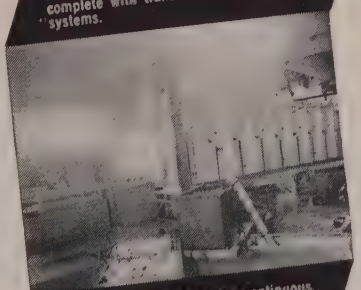
CONTINENTAL



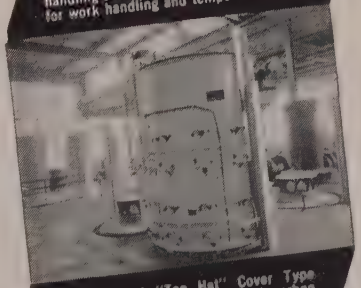
Continental Twin-Chamber Annealer of the recirculating type with automatic conveyor transfers and close-tolerance control for time-temperature cycle.



Two Continental Continuous Controlled Atmosphere Annealers, roller rail type, complete with transfer cars and conveyor systems.



Continental Stamping Annealer, continuous roller rail type, complete with baskets, handling conveyors, and automatic controls for work handling and temperature cycles.



Six Continental "Top Hat" Cover Type Furnaces for bright annealing high-carbon steel complete with gas generator and automatic controlled time-temperature cycling.

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CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and installation of the equipment including necessary work-handling accessories and control devices—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

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MANUFACTURERS—ENGINEERS—CONTRACTORS FOR OVER A QUARTER OF A CENTURY

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 147; to footnotes, page 149.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$65.50

INGOTS, Alloy (NT)

Detroit R7 .....$69.00
Houston S5 .....74.00
Midland,Pa. C18 .....69.00
Munhall,Pa. U5 .....69.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 .....$68.50
Bessemer,Pa. U5 .....68.50
Bridgeport,Conn. N19 ..73.50
Buffalo R2 .....68.50
Clairton,Pa. U5 .....68.50
Ensley,Ala. T2 .....68.50
Fairfield,Ala. T2 .....68.50
Fontana,Calif. K1 .....76.00
Gary,Ind. U5 .....68.50
Johnstown,Pa. B2 .....68.50
Lackawanna,N.Y. B2 ..68.50
LoneStar,Tex. L6 .....74.50
Munhall,Pa. U5 .....68.50
Pittsburgh J5 .....68.50
S.Chicago,Ill. R2, U5..68.50
S.Duquesne,Pa. U5 ....68.50
Youngstown R2 .....68.50

Carbon, Forging (NT)

Aliquippa,Pa. J5 .....$84.50
Bessemer,Pa. U5 .....84.50
Bridgeport,Conn. N19 ..89.50
Buffalo R2 .....84.50
Canton,O. R2 .....86.50
Clairton,Pa. U5 .....84.50
Conshohocken,Pa. A3...89.50
Ensley,Ala. T2 .....84.50
Fairfield,Ala. T2 .....84.50
Fontana,Calif. K1 ....92.00
Gary,Ind. U5 .....84.50
Geneva,Utah C11 .....84.50
Houston S5 .....89.50
Johnstown,Pa. B2 .....84.50
Lackawanna,N.Y. B2..84.50
LosAngeles B3 .....94.00
Midland,Pa. C18 .....84.50
Munhall,Pa. U5 .....84.50
Pittsburgh J5 .....84.50
Seattle B3 .....98.00
S.Chicago R2,U5,W14 ..84.50
S.Duquesne,Pa. U5 ....84.50
S.SanFrancisco B3 ....94.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2, T7 ....96.00
Conshohocken,Pa. A3..103.00
Detroit R7 .....96.00
Fontana,Calif. K1 ....115.00
Gary,Ind. U5 .....96.00
Houston S5 .....101.00
Ind.Harbor,Ind. Y1 ...96.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....116.00
Massillon,O. R2 .....96.00
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
S.Chicago R2,U5,W14 ..96.00
S.Duquesne,Pa. U5 ....96.00
Struthers,O. Y1 .....96.00
Warren,O. C17 .....96.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$103.50
Canton,O. R2 .....103.50
Cleveland R2 .....103.50
Gary,Ind. U5 .....103.50
S.Chicago R2, W14 ..103.50
S.Duquesne,Pa. U5 ...103.50

SKELP

Aliquippa,Pa. J5 .....4.325
LoneStar,Tex. L6 .....4.625
Munhall,Pa. U5 .....4.225
SparrowsPoint,Md. B2..4.225
Warren,O. R2 .....4.225
Youngstown R2, U5 ...4.225

WIRE RODS

AlabamaCity,Ala. R2 ..5.375
Aliquippa,Pa. J5 .....5.375
Alton,Ill. L1 .....5.55
Buffalo W12 .....5.375
Cleveland A7 .....5.375
Donora,Pa. A7 .....5.375
Fairfield,Ala. T2 .....5.375
Houston S5 .....5.625
IndianaHarbor,Ind. Y1..5.375
Johnstown,Pa. B2 .....5.375
Joliet,Ill. A7 .....5.375
KansasCity,Mo. S5 ....5.625
Kokomo,Ind. C16 .....5.475
LosAngeles B3 .....6.175
Minnequa,Colo. C10 ...5.625
Monessen,Pa. P7 .....5.375
N.Tonawanda,N.Y. B11 5.375
Pittsburg Calif. C11 ...5.675
Portsmouth,O. P12 ....5.375
Roebling,N.J. R5 .....5.475
S.Chicago,Ill. R2 .....5.375
SparrowsPoint,Md. B2..5.475
Sterling,Ill.(1) N15 ...5.375
Sterling,Ill. N15 .....5.475
Struthers,O. Y1 .....5.375
Worcester,Mass. A7 ...5.675

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 .....4.60
Aliquippa,Pa. J5 .....4.60
Bessemer,Ala. T2 .....4.60
Bethlehem,Pa. B2 .....4.65
Birmingham C15 .....5.10
Clairton,Pa. U5 .....4.60
Fairfield,Ala. T2 .....4.60
Fontana,Calif. K1 .....5.25
Gary,Ind. U5 .....4.60
Geneva,Utah C11 .....4.60
Houston S5 .....4.70
Ind.Harbor,Ind. I-2 ....4.60
Johnstown Pa. B2 .....4.65
KansasCity,Mo. S5 .....4.70
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.30
Minnequa,Colo. C10 ....4.90
Munhall,Pa. U5 .....4.60
Niles,Calif. P1 .....5.25
Phoenixville,Pa. P4 ....5.15
Portland,Oreg. O4 .....5.35
Seattle B3 .....5.35
S.Chicago U5, W14 ....4.60
S.SanFrancisco B3 ....5.25
Torrance,Calif. C11 ....5.30
Weirton,W.Va. W6 ....4.60

Wide Flange

Bethlehem,Pa. B2 .....4.65
Clairton,Pa. U5 .....4.60
Fontana,Calif. K1 .....5.40
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
Phoenixville Pa. P4 ....5.15
S.Chicago,Ill. U5 .....4.60

Alloy Std. Shapes

Clairton,Pa. U5 .....5.65
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....5.65
Houston S5 .....5.75
Munhall,Pa. U5 .....5.65
S.Chicago,Ill. U5 .....5.65

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....6.75
Bessemer,Ala. T2 .....6.75
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.75
Fairfield,Ala. T2 .....6.75
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.75
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1.6.75
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 .....6.85
Lackawanna,N.Y. B2 ...6.80
LosAngeles B3 .....7.45
Munhall,Pa. U5 .....6.75
Seattle B3 .....7.50
S.Chicago,Ill. U5, W14..6.75
S.SanFrancisco B3 .....7.40
Struthers,O. Y1 .....6.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.80
Lackawanna,N.Y. B2 ...6.80
Munhall,Pa. U5 .....6.75
S.Chicago,Ill. U5 .....6.75

PILING

BEARING PILES

Bethlehem,Pa. B2 .....4.65
Lackawanna,N.Y. B2 ...4.65
Munhall,Pa. U5 .....4.60
S.Chicago,Ill. U5 .....4.60

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ....5.45
Lackawanna,N.Y. B2 ...5.45
Munhall,Pa. U5 .....5.45
S.Chicago,Ill. U5 .....5.45

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.50
Aliquippa,Pa. J5 .....4.50
Ashland Ky.(15) A10 ...4.50
Bessemer,Ala. T2 .....4.50
Bridgeport Conn. N19 ..4.75
Buffalo R2 .....4.50
Clairton,Pa. U5 .....4.50
Claymont,Del. C22 .....4.80
Cleveland J5, R2 .....4.60
Coatesville,Pa. L7 .....4.80
Conshohocken,Pa. A3 ...4.50
Detroit M1 .....4.60
Ecorse,Mich. G5 .....4.60
Fairfield,Ala. T2 .....4.50
Fontana,Calif.(30) K1 ..5.15
Gary,Ind. U5 .....4.50
Geneva,Utah C11 .....4.50
GraniteCity,Ill. G4 .....4.70
Harrisburg,Pa. P4 .....5.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1.4.50
Johnstown,Pa. B2 .....4.50
Lackawanna,N.Y. B2 ..4.50
LoneStar,Tex. L6 .....4.85
Mansfield,O. E6 .....4.50
Minnequa Colo. C10 ....5.35
Munhall,Pa. U5 .....4.50
Newport,Ky. N9 .....4.50
Pittsburgh J5 .....4.50
Riverdale,Ill. A1 .....4.725
Seattle B3 .....5 40
Sharon,Pa. S3 .....4.50
S.Chicago R2, U5, W14..4.50
SparrowsPoint,Md. B2 ..4.50
Steubenville,O. W10 ....4.50
Warren,O. R2 .....4.50
Weirton,W.Va. W6 .....4.50
Youngstown R2, U5, Y1.4.50

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 .....5.65
Fontana,Calif. K1 .....6.30
Geneva,Utah C11 .....5.65
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron

Economy,Pa. B14 .....10.40

PLATES, High Strength Low-Alloy

Aliquippa,Pa. J5 .....6.725
Bessemer,Ala. T2 .....6.725
Clairton,Pa. U5 .....6.725
Cleveland J5, R2 .....6.725
Claymont,Del. C22 ....6.725
Coatesville,Pa. L7 .....7.025
Conshohocken,Pa. A3 ..6.725
Ecorse,Mich. G5 .....6.825
Fairfield,Ala. T2 .....6.725
Fontana,Calif.(30) K1..7.375
Gary,Ind. U5 .....6.725
Geneva,Utah C11 .....6.725
Houston S5 .....6.825
Ind.Harbor Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .....6.725
Munhall,Pa. U5 .....6.725
Pittsburgh J5 .....6.725
Seattle B3 .....7.625
Sharon,Pa. S3 .....6.725
S.Chicago Ill. U5, W14.6.725
SparrowsPoint,Md. B2..6.725
Warren,O. R2 .....6.725
Youngstown U5, Y1 ...6.725

PLATES, Alloy

Bridgeport,Conn. N19 ...6.55
Claymont,Del. C22 .....6.30
Coatesville,Pa. L7 .....6.30
Fontana,Calif. K1 .....6.95
Gary,Ind. U5 .....6.30
Houston S5 .....6.40
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 .....6.30
Munhall,Pa. U5 .....6.30
Newport,Ky. N9 .....6.30
Seattle B3 .....7.20
Sharon,Pa. S3 .....6.30
S.Chicago,Ill. U5, W14..6.30
SparrowsPoint,Md. B2 ..6.30
Youngstown Y1 .....6.30

FLOOR PLATES

Cleveland J5 .....5.575
Conshohocken,Pa. A3 ..5.575
Harrisburg,Pa. P4 ....5.575
Ind.Harbor,Ind. I-2 ...5.575
Munhall,Pa. U5 .....5.575
S.Chicago,Ill. U5 .....5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10...4.75
Ashland l.c.l. (15) A10..5.25
Cleveland c.l. R2 .....5.10
Warren,O. c.l. R2 .....5.10

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala.(9) R2 ....4.65
Aliquippa,Pa.(9) J5 ....4.65
Alton,Ill. L1 .....4.85
Atlanta A11 .....4.85
Bessemer,Ala.(9) T2 ....4.65
Birmingham C15 .....5.15
Bridgeport,Conn. N19 ..4.80
Buffalo(9) R2 .....4.65
Canton,O.(9) R2 .....4.75
Clairton,Pa.(9) U5 ....4.65
Cleveland(9) R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala.(9) T2 ....4.65
Fairless,Pa.(9) U5 .....4.80
Fontana,Calif. K1 .....5.35
Gary,Ind.(9) U5 .....4.65
Houston(9) S5 .....4.90
Ind.Harbor,Ind.(9) I-2..4.65
Ind.Harbor,Ind. Y1 ....4.65
Johnstown,Pa. B2 .....4.65
Joliet Ill. P22 .....5.15
KansasCity,Mo.(9) S5 ..4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.35
Massillon,O.(9) R2 ....4.75
Midland,Pa. C18 .....4.65
Milton,Pa. M18 .....4.80
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.35
N.Tonawanda,N.Y.(9) B11 4.65
Pittsburg,Calif.(9) C11..5.35
Pittsburgh(9) J5 .....4.65
Portland Oreg. O4 .....5.40
Seattle B3, N14 .....5.40
S.Chicago W14 .....4.65
S.Chicago,Ill.(9) R2, U5 4.65
S.Duquesne,Pa.(9) U5...4.65
S.SanFran.Calif. B3 ...5.40
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance Calif.(9) C11 ..5.35
Warren,O.(9) R2 .....4.65
Weirton,W.Va.(9) W6 ..4.65
Youngstown(9) R2 U5..4.65

BARS, H.R. Leaded Alloy

Warren,O. C17 .....6.325

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.575
Bridgeport,Conn. N19..5.725
Buffalo R2 .....5.575
Canton,O. R2, T7 .....5.575
Clairton,Pa. U5 .....5.575
Detroit R7 .....5.575
Ecorse,Mich. G5 .....5.675
Fairless,Pa. U5 .....5.725
Fontana,Calif. K1 .....6.625
Gary,Ind. U5 .....5.575
Houston S5 .....5.825
Ind.Harbor,Ind. I-2, Y1..5.575
Johnstown,Pa. B2 .....5.575
KansasCity,Mo. S5 .....5.825
Lackawanna,N.Y. B2 ..5.575
LosAngeles B3 .....6.625
Massillon,O. R2 .....5.575
Midland Pa. C18 .....5.575
S.Chicago R2, U5, W14.5.575
S.Duquesne,Pa. U5 .....5.575
Struthers,O. Y1 .....5.575
Warren,O. C17 .....5.575
Youngstown U5 .....5.575

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.80
Bessemer,Ala. T2 .....6.80
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.80
Cleveland R2 .....6.80
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....6.80
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
Ind.Harb.,Ind. I-2, Y1..6.80
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 .....7.05
Lackawanna,N.Y. B2 ...6.80
LosAngeles B3 .....7.50
Pittsburgh J5 .....6.80
Seattle B3 .....7.55
S.Chicago W14 .....6.80
S.Duquesne,Pa. U5 .....6.80
S.SanFrancisco B3 .....7.55
Struthers,O. Y1 .....6.80
Warren O. R2 .....6.80
Youngstown U5 .....6.80

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.80

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.65
Atlanta A11 .....4.85
Fontana,Calif. K1 .....5.35
Joliet,Ill. P22 .....5.10
Niles,Calif. P1 .....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
SanFrancisco S7 .....5.05

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.65
Gary,Ind. U5 .....5.65
Houston S5 .....5.90
KansasCity,Mo. S5 .....5.90
Youngstown U5 .....5.65

BARS, C.F. Leaded Alloy

Ambridge Pa. W18 ....8.325
Camden,N.J. P13 .....8.35
Chicago W18 .....8.325
Cleveland C20 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
SpringCity,Pa. K3 .....8.30
Warren,O. C17 .....8.325

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....6.25*
BeaverFalls,Pa. M12,R2 6.25*
Buffalo B5 .....6.30*
Camden,N.J. P13 .....6.70*
Carnegie,Pa. C12 .....6.25*
Chicago W18 .....6.25*
Cleveland A7, C20 ....6.25*
Detroit B5 .....6.45*
Detroit P17, R7 .....6.25*
Donora,Pa. A7 .....6.25*
Elyria,O. W8 .....6.25*
FranklinPark,Ill. N5 ...6.25*
Gary,Ind. R2 .....6.25*
GreenBay,Wis. F7 ....6.25*
Hammond,Ind. L2, M13.6.25*
Hartford,Conn. R2 ....6.75*
Harvey,Ill. B5 .....6.25*
LosAngeles(49) S30 ...7.70*
LosAngeles R2 .....7.70*
Mansfield,Mass. B5 ...6.80*
Massillon,O. R2, R8 ...6.25*
Midland,Pa. C18 .....6.25*
Monaca,Pa. S17 .....6.25*
Newark,N.J. W18 .....6.70*
NewCastle,Pa.(17) B4..6.25*
Pittsburgh J5 .....6.25*
Plymouth,Mich. P5 ....6.50*
Putnam Conn. W18 ....6.80*
Readville,Mass. C14 ...6.80*
S.Chicago,Ill. W14 ....6.25*
SpringCity,Pa. W3 ....6.70*
Struthers,O. Y1 .....6.25*
Waukegan,Ill. A7 .....6.25*
Worcester,Mass. W19 ..6.70*
Youngstown F3, Y1 ...6.25*

*Including 0.35c for special quality.

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..5.16

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....7.425
BeaverFalls,Pa.M12,R2 7.425
Bethlehem,Pa. B2 .....7.425
Buffalo B5 .....7.425
Camden,N.J. P13 .....7.60
Canton,O. T7 .....7.425
Carnegie Pa. C12 .....7.425
Chicago W18 .....7.425
Cleveland A7, C20 .....7.425
Detroit R7 .....7.425
Detroit B5, P17 .....7.625
Donora,Pa. A7 .....7.425
Elyria,O. W8 .....7.425
Gary,Ind. R2 .....7.425
GreenBay,Wis. F7 .....7.425
Hammond,Ind. L2, M13.7.425
Hartford,Conn. R2 ....7.725
Harvey,Ill. B5 .....7.425
Lackawanna,N.Y. B2 ..7.425
LosAngeles S30 .....9.10
Mansfield,Mass. B5 ...7.725
Massillon,O. R2, R8 ...7.425
Midland,Pa. C18 .....7.425
Monaca,Pa. S17 .....7.425
Newark,N.J. W18 .....7.60
Plymouth,Mich. P5 ....7.625
S.Chicago W14 .....7.425
SpringCity,Pa. K3 .....7.60
Struthers,O. Y1 .....7.425
Warren,O. C17 .....7.425
Waukegan,Ill. A7 .....7.425
Worcester,Mass. A7 ...7.725
Youngstown F3, Y1 ...7.425

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....4.65
Atlanta A11 .....4.85
Birmingham C15 .....5.15
Buffalo R2 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
Fairless,Pa. U5 .....4.80
Fontana Calif. K1 .....5.35
Ft.Worth,Tex.(42) T4 ..5.10
Gary,Ind. U5 .....4.65
Houston S5 .....4.90

Ind.Harbor,Ind. I-2, Y1.4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....5.15
KansasCity, Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.35
Milton,Pa. M18 .....4.80
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.35
Pittsburg,Calif. C11 ....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 ....5.40
SandSprings,Okla. S5 ...5.15
Seattle B3, N14 .....5.40
S.Chicago R2 .....4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFrancisco B3 ....5.40
SparrowsPoint,Md. B2 ..4.65
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Youngstown R2, U5, Y1.4.65

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2.6.15
KansasCity,Kans. S5 ...6.45
Lackawanna,N.Y. B2 ...6.17
Marion,O. P11 .....6.15
Pittsburgh U8 .....6.17
Seattle B3, N14 .....6.60
SparrowsPt. ½-1" B2...6.15
Williamsport,Pa. S19 ...6.00

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2..4.65
ChicagoHts.(4) C2, I-2..4.65
Ft.Worth,Tex(26) T4...5.10
Franklin,Pa.(3) F5 ....4.65
Franklin,Pa.(4) F5 ....4.65
JerseyShore,Pa.(4) J8 ...4.65
Marion,O.(3) P11 .....4.65
Moline,Ill.(3) R2 .....4.80
Tonawanda(3) B12 ....4.65
Tonawanda(4) B12 ....5.15
Williamsport,Pa.(3) S19.4.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 11.50
Economy,Pa.(D.R.)B14 14.30
Economy(Staybolt)B14. 14.65
McK.Rks. (S.R.) L5 ...11.50
McK.Rks.(D.R.) L5 ..16.00
McK.Rks.(Staybolt) L5.17.00

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.325
Allenport,Pa. P7 .....4.325
Ashland,Ky.(8) A10 ...4.325
Cleveland J5, R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit(8) M1 .....4.425
Dravosburg,Pa. U5 ....4.325
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 .....4.325
Fairless,Pa. U5 .....4.375
Fontana,Calif. K1 ....5.075
Gary,Ind. U5 .....4.325
Geneva,Utah C11 .....4.425
GraniteCity,Ill. G4 ....4.525
Ind.Harbor,Ind. I-2, Y1 4.325
Lackawanna,N.Y. B2 ..4.325
Mansfield,O. E6 (37) ..4.325
Munhall,Pa. U5 .....4.325
Newport,Ky.(8) N9 ...4.325
Niles,O. M21 .....4.325
Pittsburg,Calif. C11 ...5.025
Pittsburgh J5 .....4.325
Portsmouth,O. P12 ....4.325
Riverdale,Ill. A1 .....4.55
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 ....4.325
SparrowsPoint, Md. B2.4.325
Steubenville,O. W10 ...4.325
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5, Y1 ...4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 ....5.625
Niles,O. M21 .....5.325

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....7.20
Youngstown Y1 .....7.20

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.375
Conshohocken,Pa. A3 ..6.425
Dravosburg,Pa. U5 ...6.375
Ecorse,Mich. G5 .....6.475
Fairfield,Ala. T2 .....6.375
Fairless,Pa. U5 .....6.425
Fontana,Calif. K1 .....7.125
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1.6.375
Lackawanna(35) B2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon,Pa. S3 .....6.375
S.Chicago,Ill. U5 ....6.375
SparrowsPoint(36) B2.6.375
Warren,O. R2 .....6.375
Weirton,W.Va. W6 ....6.375
Youngstown U5, Y1 ...6.375

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.575
Ind.Harbor,Ind. I-2 ...4.575

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 ....5.325
Cleveland J5, R2 .....5.325
Conshohocken,Pa. A3 ..5.375
Dravosburg,Pa. U5 ....5.325
Detroit M1 .....5.325
Ecorse,Mich. G5 .....5.425
Fairfield,Ala. T2 .....5.325
Fairless,Pa. U5 .....5.375
Follansbee,W.Va. F4 ..5.325
Fontana,Calif. K1 ....6.425
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ....5.525
Ind.Harbor,Ind. I-2, Y1.5.325
Lackawanna,N.Y. B2 ..5.325
Mansfield,O. E6 .....5.325
Middletown,O. A10 ....5.325
Newport, Ky. N9 .....5.325
Pittsburg,Calif. C11 ..6.275
Pittsburgh J5 .....5.325
Portsmouth,O. P12 ....5.325
SparrowsPoint,Md. B2..5.325
Steubenville,O. W10 ...5.325
Warren,O. R2 .....5.325
Weirton,W.Va. W6 ....5.325
Youngstown Y1 .....5.325

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 ....7.875
Dravosburg,Pa. U5 ...7.875
Ecorse,Mich. G5 .....7.975
Fairless,Pa. U5 .....7.925
Fontana,Calif. K1 ....8.975
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1.7.875
Lackawanna(37) B2 ..7.875
Pittsburgh J5 .....7.875
SparrowsPoint(38) B2..7.875
Warren,O. R2 .....7.875
Weirton,W.Va. W6 ....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ....5.825

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky.	A10.6.90	...
Canton,O.	R2 ....6.10	6.55
Dravosburg	U5 ..6.10	...
Fairfield	T2 ....6.10	...
Gary,Ind.	U5 ....6.10	6.35
Ind.Harbor	I-2 ..6.10	6.35
Kokomo,Ind.	C16.6.20	...
MartinsFry.	W10.6.10	...
Newport,Ky.	N9..6.10	6.35
Pitts.,Calif.	C11..6.85	...
SparrowsPt.	B2..6.10	...

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....7.15
Gary,Ind. U5 .....6.35
MartinsFry,O. W10 ....6.35

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.85†
Ashland,Ky. A10 .....5.85†
Canton,O. R2 .....5.85‡
Dover,O. R1 .....5.85†
Dravosburg,Pa. U5 ...5.85†
Fairfield,Ala. T2 .....5.85†
Gary,Ind. U5 .....5.85*
GraniteCity,Ill. G4 ....6.05
Ind.Harbor,Ind. I-2 ...5.85†
Kokomo,Ind. C16 .....5.95‡
MartinsFerry,O. W10 ..5.85*
Middletown,O. A10 ....5.85†
Newport,Ky. N9 .....5.85‡
Pittsburg,Calif. C11 ...6.60*
SparrowsPt.,Md. B2 ..5.85†
Warren,O. R2 .....5.85†
Weirton,W.Va. W6 ...5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.575

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.60
SparrowsPoint(39) B2..8.60

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.25
Dravosburg,Pa. U5 ....6.25
Kokomo,Ind. C16 .....6.60
Newport,Ky. N9 .....6.25

SHEETS, Galvanized Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 .....6.10
Middletown,O. A10 ....6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.70
Niles,O.(28) R2 .....6.70
Weirton,W.Va. W6 ....6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.50
Butler,Pa. A10 (type 2).8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg,Pa. U5 ....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....6.10
Ind.Harbor,Ind. I-2 ....5.90
Middletown,O. A10 ....5.90
Niles,O. M21 .....5.90
Youngstown Y1 .....5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...7.75
Ind.Harbor,Ind. I-2 ....7.75
Yorkville,O. W10 .....7.75

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 .....6.25
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....6.25
Niles,O. M21 .....6.25
Weirton,W.Va. W6 ....6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.65

Key To Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Div., Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft.HowardSteel&Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel&Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Suppy
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md.Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 PacificStatesSteelCorp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div. U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Division, H. K. Porter. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ....4.325
Allenport,Pa. P7 .....4.325
Alton,Ill. L1 .....4.50
Ashland,Ky.(8) A10 ...4.325
Atlanta A11 .....4.525
Bessemer,Ala. T2 .....4.325
Birmingham C15 .....4.825
Bridgeport,Conn. N19 ..4.625
Buffalo(27) R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit M1 .....4.425
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....5.075
Gary,Ind. U5 .....4.325
Ind.Harbor,Ind. I-2,Y1.4.325
Johnstown,Pa.(25) B2..4.325
Lackaw'na,N.Y.(24) B2 4.325
LosAngeles(25) B3 ....5.075
Milton,Pa. M18 .....4.325
Minnequa,Colo. C10 ...5.425
Pittsburg,Calif. C11 ...5.075
Portsmouth,O. P12 ....4.325
Riverdale,Ill. A1 .....4.55
SanFrancisco S7 .....5.05
Seattle(25) B3 .....5.325
Seattle N14 .....5.40
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 ....4.325
S.SanFrancisco(25) B3.5.075
SparrowsPoint,Md. B2..4.325
Sterling(1) N15 .....4.325
Sterling,Ill. N15 .....4.425
Torrance,Calif. C11 ...5.075
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5 .....4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19 ..7.50
Carnegie,Pa. S18 .....7.20
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....7.20
Ind.Harbor,Ind. Y1 ....7.20
LosAngeles B3 .....8.40
Newport,Ky. N9 .....7.20
Sharon,Pa. S3 .....7.20
S.Chicago W14 .....7.20
Youngstown U5, Y1 ....7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.425
Conshohocken,Pa. A3 ..6.425
Ecorse,Mich. G5 .....6.525
Fairfield,Ala. T2 .....6.425
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.425
Houston S5 .....6.675
Ind.Harbor,Ind. I-2, Y1.6.425
KansasCity,Mo. S5 ....6.675
Lackawanna,N.Y. B2 ..6.425
LosAngeles(25) B3 ....7.175
Seattle(25) B3 .....7.425
Sharon,Pa. S3 .....6.425
S.SanFrancisco(25) B3.7.175
SparrowsPoint,Md. B2..6.425
Warren,O. R2 .....6.425
Weirton,W.Va. W6 ....6.425
Youngstown U5, Y1 ...6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.575

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....6.25
Baltimore T6 .....6.25
Boston T6 .....6.80
Buffalo S40 .....6.25
Cleveland A7, J5 .....6.25
Conshohocken,Pa. A3 ..6.30
Dearborn,Mich. D3 .....6.35
Detroit D2, M1, P20....6.35
Dover,O. G6 .....6.25
Ecorse,Mich. G5 .....6.35
Follansbee,W.Va. F4 ....6.25
Fontana,Calif. K1 .....8.00
FranklinPark,Ill. T6 ....6.35
Ind.Harbor,Ind. I-2 ....6.35
Ind.Harbor,Ind. Y1 ....6.25
Indianapolis C8 .....6.40
Lackawanna,N.Y. B2 ..6.25
LosAngeles C1 .....8.30
NewBedford,Mass. R10..6.70
NewBritain(10) S15 ....6.25
NewCastle,Pa. B4, E5..6.25
NewHaven,Conn. A7, D2 6.70
NewKensington,Pa. A6..6.25
Pawtucket,R.I. R3 ....6.90
Pawtucket,R.I. N8 ....6.80
Pittsburgh J5 .....6.25
Riverdale,Ill. A1 .....6.35
Rome,N.Y.(32) R6 ....6.25
Sharon,Pa. S3 .....6.25
SparrowsPt.,Md. B2 ....6.25
Trenton,N.J.(31) R5 ...7.80
Wallingford,Conn. W2 ..6.70
Warren,O. R2, T5 .....6.25
Weirton,W.Va. W6 ....6.25
Worcester,Mass. A7 ....6.80
Youngstown C8, Y1 ....6.25

STRIP, Cold-Rolled Alloy

Boston T6 .....13.80
Carnegie,Pa. S18 .....13.45
Cleveland A7 .....13.45
Dover,O. G6 .....13.45
FranklinPark,Ill. T6 ..13.45
Harrison,N.J. C18 ....13.45
Indianapolis C8 .....13.60
Pawtucket,R.I. N8 ....13.80
Sharon,Pa. S3 .....13.45
Worcester,Mass. A7 ...13.75
Youngstown C8 .....13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7 .....9.10
Dearborn,Mich. D3 ....9.20
Dover,O. G6 .....9.30
Ecorse,Mich. G5 .....9.20
Ind.Harbor,Ind. Y1 ....9.30

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.40	9.35	10.90	13.05	15.75
Boston T6	7.65	9.35	10.90	13.05	15.75
Bristol,Conn. W1	...	...	10.90	13.05	15.75
Carnegie,Pa. S18	...	9.05	10.60	12.75	....
Cleveland A7	7.10	9.05	10.60	12.75	15.45
Cleveland C7	...	9.05	10.60	12.75	15.45
Dearborn,Mich. D3	7.20	9.15	10.70	....	....
Detroit D2	7.20	9.15	10.70	12.85	....
Dover,O. G6	7.10	9.05	10.60	12.75	15.45
FranklinPark,Ill. T6	7.20	9.05	10.60	12.75	15.45
Harrison,N.J. C18	...	...	10.90	13.05	15.75
Indianapolis C8	7.25	9.20	10.60	12.75	15.45
NewBritain,Conn.(10) S15.	7.10	9.05	10.60	12.75	15.45
NewCastle,Pa. B4, E5	7.10	9.05	10.60	12.75	....
NewHaven,Conn. D2	7.55	9.35	10.90	13.05	....
NewKensington,Pa. A6	7.10	9.05	10.60	....	....
NewYork W3	...	9.35	10.90	13.05	15.75
Pawtucket,R.I. N8	7.65	9.35	10.90	13.05	15.75
Riverdale,Ill. A1	7.20	9.05	10.60	12.75	15.45
Rome,N.Y.(32) R6	7.10	9.05	10.60	12.75	15.45
Sharon,Pa. S3	7.10	9.05	10.60	12.75	15.45
Trenton,N.J. R5	...	9.35	10.90	13.05	15.75
Wallingford,Conn. W2	7.55	9.35	10.90	13.05	15.75
Warren,O. T5	7.10	9.05	10.60	12.75	15.45
Weirton,W.Va. W6	7.10	9.05	10.60	12.75	15.45
Worcester,Mass. A7, T6	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.10	9.05	10.60	12.75	15.45

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	14.80	18.15	....
Buffalo W12	...	...	14.80	....	....
FranklinPark,Ill. T6	...	...	15.30	18.65	22.50
Harrison,N.J. C18	...	...	14.80	18.15	22.00
NewYork W3	...	...	14.80	18.15	22.00
Trenton,N.J. R5	...	...	14.80	18.15	22.00
Worcester,Mass. W12	...	...	14.80	....	....
Worcester,Mass. A7, T6	...	...	14.80	18.15	22.00
Youngstown C8	...	...	15.00	18.35	22.35

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynama
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. M21	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynama
Brackenridge,Pa. A4	...	....	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	9.80*	10.40*	11.40*	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	....	10.10†	10.70†	11.70†	12.60†
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60

	Transformer Grade			
H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80§	13.35§	13.85§	14.85§

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4..	....	15.85	17.45	17.95	18.45	13.55**
Butler,Pa. A10	....	....	17.45	17.95	....	....
Vandergrift,Pa. U5 ..	14.85	15.85	17.45	17.95	....	13.55
Warren,O. R2	....	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. §Coils, ¾-cent higher. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.90	$8.15	$8.55
Dravosburg,Pa. U5	7.90	8.15	8.55
Fairfield,Ala. T2	8.00	8.25	8.65
Fairless,Pa. U5	8.00	8.25	8.65
Gary,Ind. U5	7.90	8.15	8.55
GraniteCity,Ill. G4	8.00	8.25	8.65
IndianaHarbor,Ind. I-2, Y1	7.90	8.15	8.55
Niles,O. R2	7.90	8.15	8.55
Pittsburg,Calif. C11	8.65	8.90	9.30
SparrowsPoint,Md. B2	8.00	8.25	8.65
Weirton,W.Va. W6	7.90	8.15	8.55
Yorkville,O. W10	7.90	8.15	8.55

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.675	....	....
Niles,O. R2	6.675	6.875	7.075

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.20	$9.45
Dravosburg,Pa.U5	9.20	9.45
Fairfield,Ala. T2	9.30	9.55
Fairless,Pa. U5	9.30	9.55
Gary,Ind. U5	9.20	9.45
Ind.Har. I-2, Y1	9.20	9.45
Pitts.,Calif. C11	9.95	10.20
Sp.Pt.,Md. B2	9.30	9.55
Weirton,W.Va. W6	9.20	9.45
Yorkville,O. W10	9.20	9.45

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$7.00
Dravosburg,Pa. U5 ....7.00
Fairfield,Ala. T2 .....7.10
Fairless,Pa. U5 .....7.10
Gary,Ind. U5 .....7.00
GraniteCity,Ill. G4 ....7.10
Ind.Harbor,Ind. I-2, Y1.7.00
Niles,O. R2 .....7.00
Pittsburg,Calif. C11 ....7.75
SparrowsPoint,Md. B2..7.10
Warren,O. R2 .....7.00
Weirton,W.Va. W6 .....7.00
Yorkville,O. W10 .....7.00

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5 ....6.65
Gary,Ind. U5 .....6.65
GraniteCity,Ill. G4 .....6.75
Ind.Harbor,Ind. Y1 ....6.65
Yorkville,O. W10 .....6.65

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5 ....$8.70
Gary,Ind. U5 .....8.70
Yorkville,O. W10 .....8.70

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10 .....$9.15

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5 .....$10.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..6.60
Aliquippa,Pa. J5 .....6.60
Alton,Ill. L1 .....6.775
Atlanta A11 .....6.80
Bartonville,Ill. K4 .....6.35
Buffalo W12 .....6.60
Chicago W13 .....6.60
Cleveland A7 .....6.60
Crawfordsville,Ind. M8..6.70
Donora,Pa. A7 .....6.60
Duluth,Minn. A7 .....6.60
Fairfield,Ala. T2 .....6.60
Fostoria,O.(24) S1 .....6.80
Houston S5 .....6.85
Jacksonville,Fla. M8 ...6.95
Johnstown,Pa. B2 .....6.60
Joliet,Ill. A7 .....6.60
KansasCity,Mo. S5 ....6.85
Kokomo,Ind. C16 .....6.70
LosAngeles B3 .....7.55
Minnequa,Colo. C10 ....6.85
Monessen,Pa. P7 .....6.60
Newark 6-8 ga. I-1 ....6.90
N.Tonawanda B11 .....6.60
Palmer,Mass. W12 .....6.90
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 .....6.60
Rankin,Pa. A7 .....6.60
S.Chicago,Ill. R2 .....6.60
S.SanFrancisco C10 ....7.55
SparrowsPoint,Md. B2 ..6.70
Sterling,Ill.(1) N15 ....6.60
Sterling,Ill. N15 .....6.70
Struthers,O. Y1 .....6.60
Waukegan,Ill. A7 .....6.60
Worcester,Mass. A7 ....6.90

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....7.90
Alton,Ill. L1 .....8.075
Bartonville,Ill. K4 .....8.00
Buffalo W12 .....7.90
Cleveland A7 .....7.90
Donora,Pa. A7 .....7.90
Duluth,Minn. A7 .....7.90
Fostoria,O. S1 .....7.95
Johnstown,Pa. B2 .....7.90
LosAngeles B3 .....8.85
Milbury,Mass.(12) N6 ..8.20
Minnequa,Colo. C10 ....8.15
Monessen,Pa. P16 .....7.90
Muncie,Ind. I-7 .....8.10
Palmer,Mass. W12 .....8.20
Pittsburg,Calif. C11 ....8.85
Portsmouth,O. P12 ....7.90
Roebling,N.J. R5 .....8.20
S.Chicago,Ill. R2 .....7.90
S.SanFrancisco C10 ....8.85
SparrowsPt.,Md. B2 ...8.00
Struthers,O. Y1 .....7.90
Trenton,N.J. A7 .....8.20
Waukegan,Ill. A7 .....7.90
Worcester A7,J4,T6,W12.8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....7.60
Alton,Ill. L1 .....7.775
Buffalo W12 .....7.60
Cleveland A7 .....7.60
Donora,Pa. A7 .....7.60
Duluth,Minn. A7 .....7.60
Johnstown,Pa. B2 .....7.60
KansasCity,Mo. S5 ....7.85
LosAngeles B3 .....8.55
Minnequa,Colo. C10 ...7.775
Monessen,Pa. P16 .....7.60
NewHaven,Conn. A7 ...7.90
Palmer,Mass. W12 .....7.90
Pittsburg,Calif. C11 ....8.55
Portsmouth,O. P12 ....7.60
Roebling,N.J. R5 .....7.90
S.Chicago,Ill. R2 .....7.60
S.SanFrancisco C10 ....8.55
SparrowsPoint,Md. B2 ..7.70
Struthers,O. Y1 .....7.60
Trenton,N.J. A7 .....7.90
Waukegan,Ill. A7 .....7.60
Worcester,Mass. A7 ....7.90

WIRE, Fine & Weaving (8"Coils)

Alton,Ill. L1 .....12.725
Bartonville,Ill. K4 ....12.65
Buffalo W12 .....12.55
Chicago W13 .....12.55
Cleveland A7 .....12.55
Crawfordsville,Ind. M8.12.65
Fostoria,O. S1 .....12.55
Jacksonville,Fla. M8 ..12.90
Johnstown,Pa. B2 .....12.55
Kokomo,Ind. C16 .....12.55
Minnequa,Colo. C10 ...12.30
Monessen,Pa. P6 .....12.55
Muncie,Ind. I-7 .....12.75
Palmer,Mass. W12 .....12.85
Roebling,N.J. R5 .....12.85
S.SanFrancisco C10 ...12.90
Waukegan,Ill. A7 .....12.55
Worcester,Mass. A7,T6.12.85

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4 ....10.70
Buffalo W12 .....10.70
Johnstown,Pa. B2 .....10.70
Minnequa,Colo. C10 ...10.825
Monessen,Pa. P16 .....10.70
Muncie,Ind. I-7 .....10.90
Pittsburg,Calif. C11 ...11.50
Portsmouth,O. P12 ....10.70
Roebling,N.J. R5 .....11.00
SparrowsPt.,Md. B2 ....10.80
Struthers,O. Y1 .....10.70

ROPE WIRE (A)

Bartonville,Ill. K4 ....10.55
Buffalo W12 .....10.55
Fostoria,O. S1 .....10.55
Johnstown,Pa. B2 .....10.55
Monessen,Pa. P16 .....10.55
Muncie,Ind. I-7 .....10.75
Palmer,Mass. W12 .....10.85
Portsmouth,O. P12 ....10.55
Roebling,N.J. R5 .....10.85
SparrowsPt. B2 .....10.65
Struthers,O. Y1 .....10.55
Worcester,Mass. J4 ....10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead
Bartonville,Ill. K4 ....14.15
Monessen,Pa. P16 ....14.20
Roebling,N.J. R5 ....14.35

WIRE, Cold-Rolled Flat
Anderson,Ind. G6 .....9.00
Baltimore T6 .....9.80
Buffalo W12 .....9.00
Cleveland A7 .....9.50
Crawfordsville,Ind. M8..9.00
Dover,O. G6 .....9.00
Fostoria,O. S1 .....9.00
FranklinPark,Ill. T6 ..9.60
Kokomo,Ind. C16 .....9.00
Massillon,O. R8 .....9.00
Milwaukee C23 .....9.20
Monessen,Pa. P16 .....9.00
Pawtucket,R.I. N8 ....9.80
Riverdale,Ill. A1 .....9.10
Rome,N.Y. R6 .....9.00
Trenton,N.J. R5 .....9.80
Worcester A7, T6, W12 9.80

NAIL, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	...152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	.154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston,Tex. D7	157
Houston,Tex. S5	157
Jack'ville,Fla.(23) M8	..162
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa.	A3..$9.05
Wheeling,W.Va. W10	..9.05

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind.	M8..154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Jack'ville,Fla.(23)	M8...162
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala.	R2..$9.35
Bartonville,Ill. K4	....9.45
Buffalo W12	.....9.35
Crawfordsville,Ind.	M8..9.45
Donora,Pa. A7	.....9.35
Duluth,Minn. A7	.....9.35
Jacksonville,Fla. M8	....9.88
Johnstown,Pa. B2	.....9.35
Joliet,Ill. A7	.....9.35
Kokomo,Ind. C16	.....9.45
LosAngeles B3	.....10.14
Minnequa,Colo. C10	....9.60
Pittsburg,Calif. C11	...10.13
S.Chicago,Ill. R2	.....9.35
SparrowsPt.,Md. B2	....9.45
Sterling,Ill. N15	.....9.35

Coil No. 6500 Stand.	
AlabamaCity,Ala.	R2..$9.65
Bartonville,Ill. K4	....9.75
Buffalo W12	.....9.65
Crawfordsville,Ind.	M8..9.75
Donora,Pa. A7	.....9.65
Duluth,Minn. A7	.....9.65
Jacksonville,Fla. M8	...10.18
Johnstown,Pa. B3	.....9.65
Joliet,Ill. A7	.....9.65
Kokomo,Ind. C16	.....9.75
LosAngeles B3	.....10.45
Minnequa,Colo. C10	...9.90
Pittsburg,Calif. C11	...10.45
S.Chicago,Ill. R2	.....9.65
SparrowsPt.,Md. B2	....9.75
Sterling,Ill. N15	.....9.65

Coil No. 6500 Interim	
AlabamaCity,Ala.	R2..$9.70
Bartonville,Ill. K4	.....9.80
Buffalo W12	.....9.70
Crawfordsville,Ind.	M8..9.80
Donora,Pa. A7	.....9.70
Duluth,Minn. A7	.....9.70
Jacksonville,Fla. M8	...10.23
Johnstown,Pa. B2	....9.70
Joliet,Ill. A7	.....9.70
Kokomo,Ind. C16	.....9.80
LosAngeles B3	.....10.50
Minnequa,Colo. C10	....9.95
Pittsburg,Calif. C11	...10.50
S.Chicago,Ill. R2	.....9.70
SparrowsPt.,Md. B2	....9.80
Sterling,Ill. N15	.....9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala.	R2..175**
Aliquippa,Pa. J5	.....172§
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind.	M8..181
Donora,Pa. A7	.....175†
Duluth,Minn. A7	.....175†
Fairfield,Ala. T2	.....175†
Houston,Tex. S5	.....180**
Jacksonville,Fla. M8	...186
Johnstown,Pa. B2	....179*
Joliet,Ill. A7	.....175†
KansasCity,Mo. S5	....180**
Kokomo,Ind. C16	....177†
Minnequa,Colo. C10	...180**
Monessen,Pa. P7	....178††
Pittsburg,Calif. C11	...195†
Rankin,Pa. A7	.....175†
S.Chicago,Ill. R2	.....175**
S.SanFrancisco C10	...195**
SparrowsPoint,Md. B2	..181*
Sterling,Ill.(1) N15	...179††

WOVEN Fence, 9-15 ga. Col.
Ala.City,Ala. R2 ....162**
Ala.City, 17 ga. R2 ...257**
Ala.City, 18 ga. R2 ...267**
Aliq'ppa,Pa.9-14½ga J5 165§
Atlanta A11 168
Bartonville,Ill. K4 168
Crawfordsville,Ind. M8 ..168
Donora,Pa. A7 .....162†
Duluth,Minn. A7 .....162†
Fairfield,Ala. T2 .....162†
Houston,Tex. S5 .....167**
Jacksonville,Fla. M8 173
Johnstown,Pa.(43) B2 ..166
Joliet,Ill. A7 .....162†
KansasCity,Mo. S5 ....167**
Kokomo,Ind. C16 .....164†
Minnequa,Colo. C10 ....167**
Monessen,Pa. 9 ga. P17 166††
Pittsburg,Calif. C11 ...185†
Rankin,Pa. A7 .....162†
S.Chicago,Ill. R2 .....162**
Sterling,Ill.(1) N15 ..166††

WIRE (16 Gage)	An'ld Galv. Stone Stone
Ala.City R2	...14.50 16.05**
Bartonville K4	..14.50 16.55
Buffalo W12	....14.50 ....
Cleveland A7	....14.50 ....
Crawf'dsville M8	.14.60 16.55
Fostoria,O. S1	..14.60 16.15†
Jacksonville M8	..14.85 16.80
Johnstown B2	..14.50 16.40*
Kokomo C16	...14.60 16.15†
Minnequa C10	..14.75 16.45**
Palmer,MassW12	14.50 16.05*
Pitts.,Calif. C11	.14.85 16.40†
S.Chicago R2	..14.50 16.05**
SparrowsPt. B2	.14.60 16.50*
Sterling(1) N15	14.50 16.45††
Waukegan A7	..14.50 16.05†
Worcester A7	...14.80 ....

WIRE, Merchant Quality (6 to 8 gage)	An'ld Galv.
Ala.City,Ala.	R2.7.40 7.80**
Aliquippa J5	....7.40 7.925§
Atlanta A11	.....7.50 8.10
Bartonville(48)	K4 7.50 8.10
Buffalo W12	....7.40 8.80†
Cleveland A7	....7.40 ....
Crawfordsville	M8.7.50 8.10
Donora,Pa. A7	...7.40 7.80†
Duluth,Minn. A7	..7.40 7.80†
Fairfield T2	....7.40 7.80†
Houston(48)	S5..7.65 8.05**
Jacks'ville,Fla.	M8 7.75 8.35
Johnstown B2(48)	7.40 7.975*
Joliet,Ill. A7	....7.40 7.80†
Kans.City(48)	S5 7.65 8.05**
Kokomo C16	....7.50 7.90†
LosAngeles B3	..8.35 8.925*
Minnequa C10	...7.65 8.05**
Monessen P7(48)	7.40 8.00††
Palmer,Mass.	W12 7.70 8.10†
Pitts.,Calif. C11	..8.35 8.75†
Portsmouth,O.	P12 7.40 ....
Rankin A7	.....7.40 7.80†
S.Chicago R2	....7.40 7.80**
S.SanFran.	C10..8.35 8.75**
Spar'wsPt.B2(48)	7.50 8.075*
Str'ing(1)(48)	N15 7.40 8.00††
Struthers,O.(48)	Y1 7.40 7.90‡
Worcester,Mass.	A7 7.70 ....

*Based on 12.50c zinc; †5c zinc; §10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras. ††13c zinc.

FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

Carriage, Machine Bolts
Full-Size Body (cut thread)
†1⅛" x 6" and smaller 61
Larger than ½" diam. and all diams. longer than 6" 55
Under-Size Body (rolled thread; not nutted):
½" x 6" and smaller. 61

†1½" x 4" and smaller and shorter are not nutted.

NUTS
Reg. & Heavy Square Nuts, all sizes 61
H. P. Reg. & Heavy Hex
Nuts:
¾" & smaller 64
⅞" to 1⅛" incl. 63
1¼" to 1½" incl. 65
1⅝" & larger 61
C.P. Reg. & Heavy Hex Nuts
¾" & smaller 64
⅞" & larger 61
Semifinished & Finished Nuts
¾" & smaller 66
⅞" & larger 63
Semifinished Slotted Reg. & Heavy Hex Nuts
¾" & smaller 66
⅞" & larger 63
Hot Galvanized Nuts, all types
1½" & smaller 44
(On above items, add 25% for less than case quantities)

CAP SCREWS
(New Std., hexagon head, upset, packages)
Bright:
6" and shorter:
¼" through ½" diam. 34
⅝" & ⅝" diam. 31
¾", ⅞", 1" 8
Longer than 6"
¼" through ⅝" diam. 3
¾" through 1" diam. .+13
High Carbon, Heat-treated:
6" and shorter:
¼" through ½" diam. 20
⅝" & ⅝" diam. 16
¾", ⅞", 1" .....+11
Longer than 6"
¼" through ⅝" diam. +23
¾" through 1" diam. .+41
(New Std. Hexagon head, upset, bulk)
Bright:
½" x 6" & smaller & shorter 49
⅝" & ⅝" diam. x 6" & shorter 48
¾", ⅞", 1" x 6" & shorter 31
High Carbon, Heat-treated:
½" x 6" & smaller & shorter 41
⅝" x ⅝" diam. & 6" & shorter 39
¾", ⅞", 1" x 6" & shorter 20

MACHINE SCREW NUTS & STOVE BOLT NUTS (Bulk)
No. 2 to ⅜" incl., Square:
25,000 to 199,999 pieces 20
200,000 or more pieces 27
No. 2 to ⅜" incl., Hex.:
25,000 to 199,999 pieces 18
200,000 or more pieces 25

MACHINE SCREWS, SLOTTED (Bulk)
No. 2 to ¼" diam. incl.:
25,000 to 199,999 pieces 20
200,000 or more pieces 27
5/16" to ½" diam. incl.:
15,000 to 99,999 pieces 20
100,000 or more 27

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.06	20.42
1¼	13	....	24.94	20.45
1½	13	23.31	27.57	22.61
1¾	13	27.54	32.57	26.71
2	13	30.87	36.51	29.93
2¼	13	34.77	41.12	33.72
2¼	12	37.73	44.63	36.60
2½	12	41.57	49.16	40.31
2¾	12	45.00	53.22	43.65
3	12	47.99	56.76	46.55

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	....	5.65
Fairfield,Ala. T2	....	....	....	5.65
Gary,Ind. U5	4.725	4.625	4.675	...
Huntington,W.Va. W7	....	....	....	5.65
IndianaHarbor,Ind. I-2	4.725	4.625	4.675	...
Johnstown,Pa. B2	....	....	...(16)	5.65
Lackawanna,N.Y. B2	....	....	...(16)	5.65
Minnequa,Colo. C10	4.725	4.625	....	6.15
Steelton,Pa. B2	4.725	4.625	....	...
Williamsport,Pa. S19	....	....	....	5.65

TIE PLATES
Fairfield,Ala. T2 ....5.625
Gary,Ind. U5 .....5.625
Ind.Harbor,Ind. I-2 ...5.625
Lackawanna,N.Y. B2..5.625
Minnequa,Colo. C10 ...5.625
Seattle B3 .....5.775
Steelton,Pa. B2 .....5.625
Torrance,Calif. C11 ...5.775

TRACK BOLTS (20) Treated
Cleveland R2 .....12.90
KansasCity,Mo. S5 ....12.90
Lebanon,Pa. B2 ....12.15*
Minnequa,Colo. C10 ...12.15*
Pittsburgh O3, P14 ..12.15*
Seattle B3 .....12.65*

*Untreated

AXLES
Ind.Harbor,Ind. S13 ....7.25
Johnstown,Pa. B2 .....7.50

JOINT BARS
Bessemer,Pa. U5 ....5.825
Fairfield,Ala. T2 .....5.825
Ind.Harbor,Ind. I-2 ...5.825
Joliet,Ill. U5 .....5.825
Lackawanna,N.Y. B2 ..5.825
Minnequa,Colo. C10 ...5.825
Steelton,Pa. B2 .....5.825

SCREW SPIKES
Cleveland R2 .....11.90
Pittsburgh O3 .....11.90

STANDARD TRACK SPIKES
Fairfield,Ala. T2 .....7.90
Ind.Harbor,Ind. I-2, Y1.7.90
KansasCity,Mo. S5 ....7.90
Lebanon,Pa. B2 .....7.90
Minnequa,Colo. C10 ....7.90
Pittsburgh J5 .....7.90
Seattle B3 .....8.40
S.Chicago,Ill. R2 .....7.90
Struthers,O. Y1 .....7.90
Youngstown R2 .....7.90

METAL POWDER

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

Sponge iron: Cents
98+% Fe, annealed. 9.25
Swedish, c.i.f. Camden, N. J., c.l. in bags. 9.50
Domestic, f.o.b., Johnstown, Pa., Riverton, N.J., Niagara Falls, N.Y., in bags 9.50
Canadian, f.o.b. shipping point 9.50
Electrolytic iron:
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in. 22.00
Annealed, 99.5% Fe. 36.50
Unannealed (99+% Fe) 34.00
Unannealed (99+% Fe) (minus 325 mesh) 57.00
Powder Flakes (minus 16, plus 100 mesh).. 31.00
Carbonyl Iron:
98.1-99.9%, 3 to 20 microns, depending on grade, $6.00-275.00, in standard 200-lb. containers; all minus 200 mesh.
Aluminum:
Atomized, 500 lb, drum frght. allowed
Carlots 34.50
Ton lots 36.50
Antimony, 500 lb lots 32.00*
Brass, 5000-lb lots .....*39.75-55.00*†
Bronze, 5000-lb lots .....*66.50-70.75*†
Copper:
Electrolytic 14.25*
Reduced 14.25*
Lead 7.50*
Manganese:
Minus 35 mesh 64.00
Minus 100 mesh 70.00
Minus 200 mesh 75.00
Nickel, unannealed ... $1.00
Nickel-Silver, 5000-lb lots .....*61.75-64.25*†
Phosphor-Copper, 5000-lb lots 68.75
Silicon 47.50
Solder 7.00*
Stainless Steel, 302 .. 99.00
Stainless Steel, 316 .. $1.32
Tin 14.50*
Zinc 5000-lb lots 19.25-33.00‡
Tungsten Dollars
Melting grade, 99% 60 to 200 mesh:
1000 lb and over... 4.50
Less than 1000 lb.. 4.65
Chromium, electrolytic 99.8% Cr min. metallic basis 5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago Base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½-in. to less than 1 7/16-in.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Plus 4c per 100 lb.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill and 0.45c for carbon, add 0.40c for alloy and 0.45c H.S.-L.A.
(31) Widths over 5/8-in.; 6.90c for widths 5/8-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.25c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 7.95c over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Ambridge, Pa. N2	6.5	..	10.5	...	13	...	14.5	...	14.5	...	14	...	16.5	...
Lorain, O. N3	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Youngstown Y1	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Alton, Ill. L1	...	...	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Benwood, W. Va. W10	17.5	+13	9	+18.5	+0.75	+28.5	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Butler, Pa. F6	18	+12.5	9.5	+18	1.5	+26	...	...	...	...	...	...	...	...
Etna, Pa. N2	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Fairless, Pa. N3	...	...	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Fontana, Calif. K1	...	...	....	....	....	....	7	+12.25	10	+8.25	12.5	+4.75	15	+3
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	17.5	+1.75	20.5	2.25	23	5.75	25.5	7.5
Lorain, O. N3	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sharon, Pa. S4	18	+12.5	9.5	+18	1.5	+26	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sparrows Pt., Md. B2	16	+12.5	7.5	+18	+0.5	+25	16.5	+0.75	19.5	3.25	22	6.75	24.5	8
Youngstown R2, Y1	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Wheatland, Pa. W9	18	+12.5	9.5	+18	1.5	+26	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Alton, Ill. L1	25	7.5	25.5	8	27	8.75	27	8.75	....	...	....	...
Benwood, W. Va. W10	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Etna, Pa. N2	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Fairless, Pa. N3	25	7.5	25.5	8	27	8.75	27	8.75	17.5	+1.25	17.5	+1.25
Fontana, Calif. K1	15.5	+2	16	+1.5	17.5	+0.75	17.5	+0.75	8	+10.75	8	+10.75
Ind. Harbor, Ind. Y1	26	8.5	26.5	9	28	9.75	28	9.75	18.5	+0.25	18.5	+0.25
Lorain, O. N3	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Sharon, Pa. M6	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Sparrows Pt., Md. B2	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Youngstown R2, Y1	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Wheatland, Pa. W9	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	Seamless Tube Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	18.50	23.00	....	....	31.00	....	....	....	42.25	39.00
202	19.75	25.50	31.00	36.25	33.50	....	36.75	38.75	42.50	42.50
301	19.25	23.75	....	36.75	32.00	36.00	38.00	....	44.25	41.00
302	20.50	26.25	32.00	37.25	34.50	36.25	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	36.25	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	39.00	41.00	....	....	....
304	21.75	27.50	33.75	39.00	37.25	38.25	40.25	43.00	47.25	47.25
304L	....	....	38.75	44.00	42.25	43.25	45.25	48.00	52.25	52.25
305	23.25	30.25	....	39.50	40.25	38.25	40.25	43.50	50.25	50.25
308	23.50	30.50	38.50	44.25	41.25	43.25	45.50	49.75	52.00	52.00
309	31.00	39.75	46.75	53.50	53.50	52.00	54.75	58.25	67.00	67.00
310	37.25	48.00	62.25	72.25	68.50	69.75	73.50	75.25	78.75	78.75
314	....	....	....	....	....	69.75	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	57.75	60.75	64.00	68.25	68.25
316L	....	....	56.25	64.50	63.25	62.75	65.75	69.00	73.25	73.25
317	37.25	48.25	62.75	72.75	73.50	70.75	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	43.00	45.25	49.25	54.25	54.25
18-8CbTa	29.25	38.00	45.75	52.25	53.25	50.75	53.50	58.00	66.50	66.50
403	....	....	28.75	32.75	....	32.25	34.00	36.25	....	....
405	17.50	23.00	26.75	31.00	32.25	30.50	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	29.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	29.50	31.00	....	....	....
420	....	30.25	31.00	36.00	37.75	35.50	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	29.50	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	30.00	31.50	....	....	....
431	....	25.50	33.25	....	....	37.25	39.25	40.75	....	....
446	....	....	35.50	40.50	53.25	40.00	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 10%	Plates—Carbon Base 20%	Sheets Carbon Base 20%
302	....	....	30.50
304	30.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.80	33.35	....
410	25.30	32.85	....
430	25.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.65	....
Nickel, Low Carbon	43.25	60.05	....
Monel	42.35	56.35	....
Copper*	....	....	46.00

	Strip, Carbon Base—Cold Rolled 10%	Strip, Carbon Base—Cold Rolled Both Sides
Copper*	30.00	38.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.090
18.25	4.25	1	4.75	...	2.305-2.475
18	4	2	9	...	2.675-2.6775
18	4	2	....	...	1.765
18	4	1	....	...	1.600
13.75	3.75	2	5	...	2.245
13.5	4	3	....	...	1.865
9	3.5	..	....	...	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	54.50	....	....	....
Birmingham R2	54.50	55.00‡	....	....
Birmingham U6	....	55.00‡	59.00	....
Woodward,Ala. W15	54.50	55.00‡	59.00	....
Cincinnati, deld.	....	62.70	....	....
Buffalo District				
Buffalo H1, R2	58.50	59.00	59.50	60.00
Tonawanda,N.Y. W12	58.50	59.00	59.50	60.00
N.Tonawanda, N.Y. T9	....	59.00	59.50	60.00
Boston, deld.	69.15	69.65	70.15	....
Rochester,N.Y. deld.	61.52	62.02	62.52	....
Syracuse,N.Y. deld.	62.62	63.12	63.62	....
Chicago District				
Chicago I-3	58.50	59.00	59.00	59.50
Gary,Ind. U5	58.50	....	59.00	....
S.Chicago R2	58.50	....	59.00	....
S.Chicago,Ill. Y1	58.50	59.00	59.00	59.50
S.Chicago,Ill. U5, W14	58.50	....	59.00	59.50
Milwaukee, deld.	60.67	61.17	61.17	61.17
Muskegon,Mich. deld.	....	65.30	65.30	....
Cleveland District				
Cleveland A7, R2	58.50	59.00	59.00	59.50
Akron,O., deld.	61.25	61.75	61.75	62.25
Lorain,O. N3	58.50	....	....	59.50
Mid-Atlantic District				
Bethlehem,Pa. B2	60.50	61.00	61.50	62.00
NewYork, deld.	....	64.73	65.23	....
Newark, deld.	63.52	64.02	64.52	65.02
Birdsboro,Pa. B10	60.50	61.00	61.50	62.00
Chester,Pa. P14	60.50	61.00	61.50	....
Philadelphia, deld.	62.16	62.66	63.16	....
Steelton,Pa. B2	60.50	61.00	61.50	62.00
Swedeland,Pa. A3	60.50	61.00	61.50	62.00
Philadelphia, deld.	62.16	62.66	63.16	63.66
Troy,N.Y. R2	60.50	61.00	61.50	62.00
Pittsburgh District				
NevilleIsland,Pa. P6	58.50	59.00	59.00	....
Pittsburgh (N&S sides), Aliquippa, deld.	....	60.37	60.37	60.87
McKeesRocks, deld.	....	60.04	60.04	60.54
Lawrenceville,Homestead, Wilmerding, Monaca, deld.	....	60.66	60.66	61.16
Verona,Trafford, deld.	60.69	61.19	61.19	61.69
Brackenridge, deld.	60.95	61.45	61.45	61.95
Bessemer,Pa. U5	58.50	....	59.00	59.50
Clairton,Rankin,S.Duquesne,Pa. U5.	58.50	....	....	....
McKeesport,Pa. N3	58.50	....	....	59.50
Midland,Pa. C18	58.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	59.00	....
Sharpsville,Pa. S6	58.50	....	59.00	59.50
Youngstown Y1	....	....	59.00	59.50
Youngstown U5	58.50	....	....	59.50
Mansfield,O., deld.	63.40	....	63.90	64.40
Duluth I-3	58.50	59.00	59.00	59.50
Erie,Pa. I-3	58.50	59.00	59.00	59.50
Everett,Mass. E1	62.00	62.50	63.00	....
Fontana,Calif. K1	64.50	65.00	....	....
Geneva,Utah C11	58.50	59.00	....	....
GraniteCity,Ill. G4	60.40	60.90	61.40	....
Ironton,Utah C11	58.50	59.00	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo. C10	60.50	61.00	61.50	....
Rockwood,Tenn. T3	....	55.00‡	59.00	....
Toledo,O. I-3	58.50	59.00	59.00	59.50
Cincinnati, deld.	64.26	64.76	....	....

*Phos. 0.51-0.75%; $56, Phos. 0.31-0.50%.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$67.50
Buffalo H1	68.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	95.50
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	98.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$72.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	72.50
Steelton,Pa. B2 (Phos. 0.035% max)	66.50
Philadelphia, deld.	70.05
Troy,N.Y. R2 (Phos. 0.035% max)	66.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Pittsburgh P6 (Intermediate) (Phos. 0.036-0.075% max)	63.50

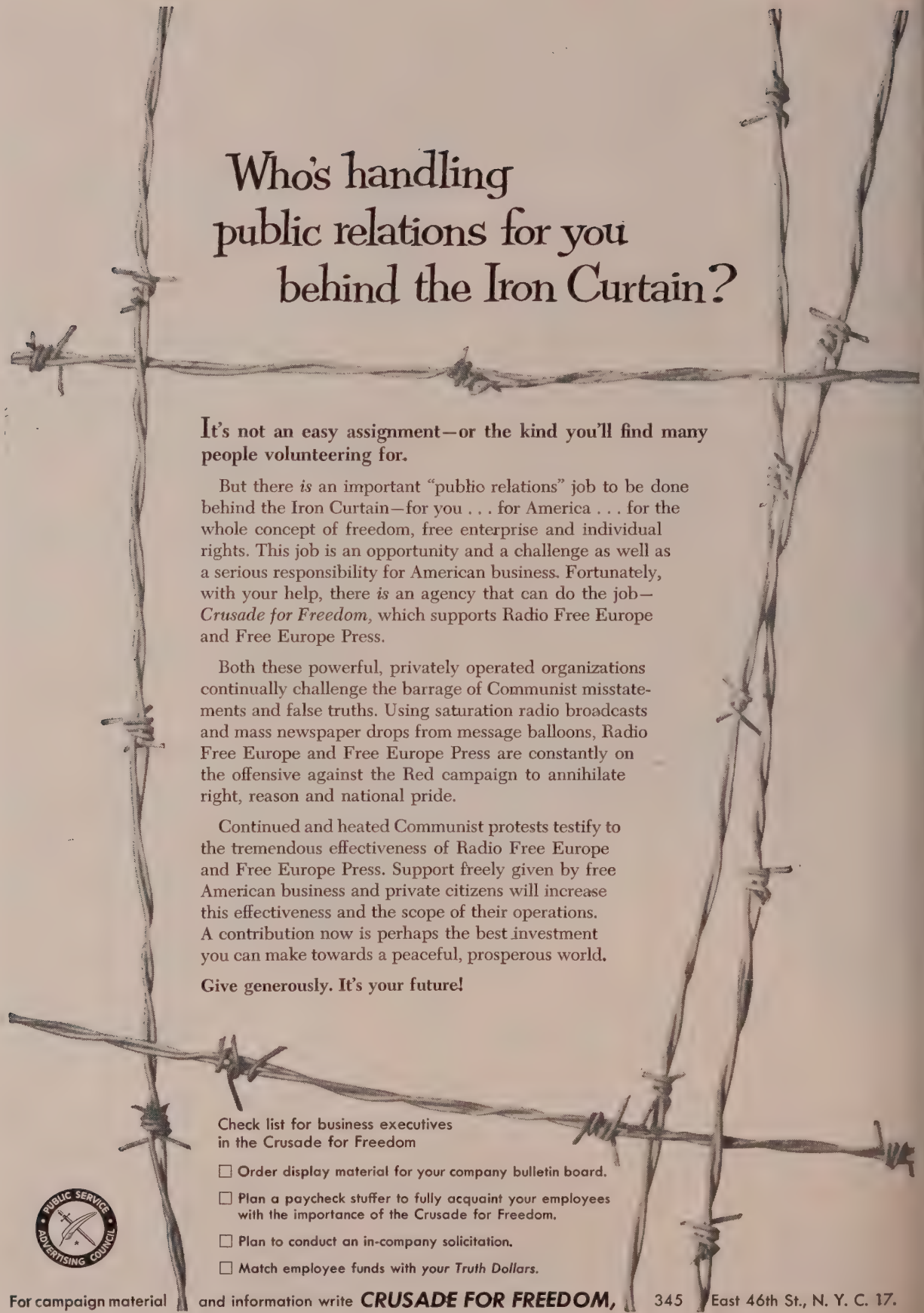
Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Mer-chant Qual.	H.R. Spec. Qual.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	7.42	...	9.39	....	7.63	7.49	9.48
Baltimore	7.21	8.32	8.50	....	7.91	7.53	...	8.62[3]	13.49	7.93	7.21	8.98
Birmingham	7.00	8.24	8.85	....	7.21	7.27	7.80	9.35	....	7.43	7.14	9.34
Boston	7.88	8.81	10.27	53.32	7.96	7.87	8.40	9.67	13.50	8.13	8.20	9.47
Buffalo	7.05	8.25	10.01	....	7.35	7.35	8.20	7.90	13.35	7.60	7.35	8.90
Chattanooga	7.28	8.44	8.60	....	7.36	7.42	7.95	9.18	....	7.43	7.45	9.32
Chicago	7.13	8.24	9.10	46.75	7.21	7.27	7.80	7.75	13.05	7.43	7.45	8.61
Cincinnati	7.12	8.23	9.10	46.10	7.45	7.51	8.04	8.15	13.29	7.90	7.43	8.86
Cleveland	7.13	8.24	8.95	49.16	7.31	7.33	7.86	8.00	13.11	7.76	7.62	8.78
Detroit	7.19	8.43	9.38	43.50	7.49	7.55	8.08	8.04	13.25	7.90	7.42	8.80
Erie, Pa.	7.08	8.24	8.95[10]	....	7.31	7.35	...	8.10[10]	....	7.65	7.30	8.79
Houston	7.85	8.75	10.49	....	8.15	8.25	...	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.44	8.50	9.20	....	7.42	7.57	8.10	9.44	....	7.73	7.75	9.39
Los Angeles	8.50	10.00	11.00	51.50	8.35	8.15	8.70	10.90	14.35	8.30	8.75	10.85
Milwaukee	7.22	8.33	9.19	....	7.30	7.36	7.89	7.94	13.14	7.60	7.54	8.70
Moline, Ill.	7.15	8.44	8.85	....	7.41	7.43	...	8.10	....	7.63	7.34	...
New York	7.61	8.84	9.59	47.57	8.17	8.11	8.66	9.72	13.43	8.09	7.86	9.29
Norfolk, Va.	7.25	...	...	....	7.65	7.65	...	9.50	....	7.95	7.45	8.95
Philadelphia	7.32	8.42	9.37	45.98	7.93	7.68	8.21	8.46	13.21	7.74	7.68	8.80**
Pittsburgh	7.13	8.24	9.40	49.00	7.21	7.27	7.80	8.00	13.05	7.43	7.45	8.61
Portland, Oreg.	7.80	8.80	10.65	....	8.00	7.95	...	12.20	15.00	7.85	7.75	9.60
Richmond, Va.	7.25	...	9.49	....	7.85	7.85	8.38	9.50	....	8.10	7.50	9.35
St. Louis	7.42	8.53	9.69	43.89	7.50	7.56	8.09	8.29	13.34	7.83	7.74	8.90
St. Paul	7.46	8.59	9.16	....	7.72	7.74	...	8.51	13.51	7.94	7.65	9.12
San Francisco	8.10	9.65	10.15	51.65	8.35	8.10	8.65	11.40	14.30[3]	8.20	8.00	10.20
Seattle	8.65	10.40	10.80	54.00	8.90	8.60	9.15	12.10	14.65	8.40	8.40	10.65
Spokane	8.65	11.00[7]	10.80	....	8.90	8.60	9.15	12.10	15.40	8.40	8.40	10.60
Washington	7.59	8.70	7.97	....	8.12	8.08	...	9.09	....	8.51	7.91	9.36

*Prices do not include gage extras; †prices include gage and coating extras (based on 13.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [3]—500 to 9999 lb; [4]—400 to 999 lb; [5]—4000 lb and over; [6]—1000 to 1999 lb; [7]—1000 lb and over; [8]—1500 to 3999 lb; [9]—2000 to 3999 lb; [10]—f.o.b. local delivery in lots of 10,000 lb and over; [11]—2000 lb and over.



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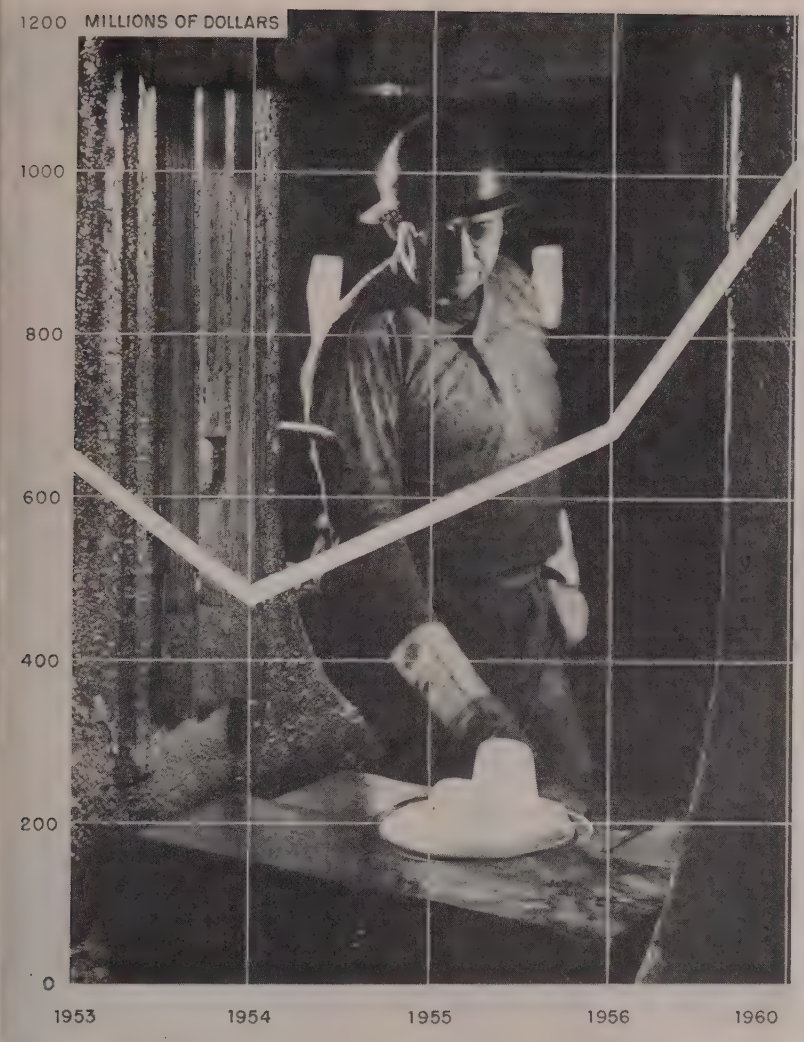


Source: Drop Forging Association—1956 and 1960 estimated

Drop Forgers Set Goal

Industry looks for record dollar volume in 1956. By 1960, it hopes to be in the $1-billion class. Emphasis on research will help it reach that level

"THIS could be the top year for our industry despite cutbacks in automotive requirements," says Charles W. Stone, president of the Drop Forging Association, Lansing, Mich. That would make it a most unusual year. Automakers normally take 60 per cent of the industry's output.

Mr. Stone figures it this way: Even though automotive use is down, it will still represent a sizable tonnage. In addition, there will be strong demand from construction equipment builders, oil producers, railroads, mining equipment builders, agricultural machinery manufacturers and others. In the aggregate, this demand could offset a lag in auto requirements and possibly even increase over-all tonnage. He also feels that, in relation to competitive products in recent years, forgings have come out on top. He sees no reason why this should not continue.

Depends on Steel—Last year's volume was limited by the shortage of steel. This year, steel supply still will be tight, but Mr. Stone does not anticipate quite the same stringency as in 1955. Shipments of drop forgings last year were 1,023,000 tons, compared with 833,000 tons in 1954 and 1,152,000 tons in 1953. The shipment record, 1,174,000 tons, was racked up in 1951, while the dollar record belongs to 1953 (see chart).

Edgar L. Harden, executive vice president of the association, says the industry is shooting for a new record of $674 million in sales this year. He further expects the industry to be in the $1-billion class by 1960. The association, which has 101 members and accounts for about 85 per cent of the industry's business, currently is turning its effort to more and better research. The country generally has increased its expenditures for industrial research from $900 million to about $5 billion in the last 15 years, with about 95 per cent going into applied research and the remainder into fundamental research. "The drop forging industry has not devoted as much of its resources to research as some other allied industries," Mr. Harden says. "But by 1960, drop forgers will have stepped up their activities to at least a parity with others in the metal fabrication field, on the basis of relative resources."

Plates . . .

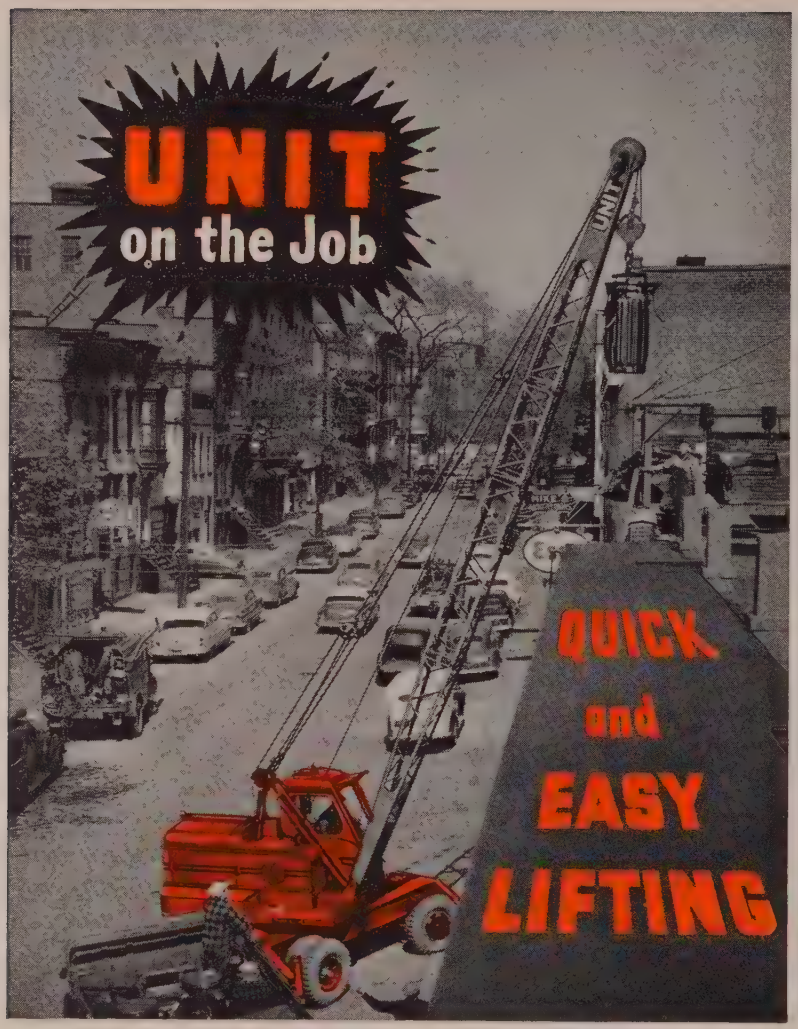
Plate Prices, Page 146

Ship demand for plates is beginning to be felt. Eastern shipyards are stepping up their requirements noticeably and are finding supplies scarce. Their needs are expected to expand throughout the year.

This means that the tight supply situation in the plate market will intensify, if anything, as the weeks pass. Currently, the shortage of plates is hampering activity in a number of areas. A major producer of large diameter electricweld tubes has had to cut its production because of the lack of plates.

Also, it's reported freight car manufacturing is not meeting railroad requirements. Some plate mills are concentrating on production for the emergency needs of the carriers, thus making it more difficult for construction companies to obtain tonnage. The result is many fabricators are trying to fill their needs at the warehouse level.

Bridge fabricating shops in the East need plates to maintain operating schedules. Tank builders' order volume is showing a seasonal increase. While heavy shipments of overdue tonnage has helped the fabricators, their new orders for light gage plates are restricted to established quotas for second quarter. Rated or defense-connected tonnage demand is heavier, notably for clad plates. This class of order is estimated to be running up to as much



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All Models Convertible to ALL Attachments!

as 15 per cent of output with some eastern mills.

In New England, two oil refining plants, at Tiverton and Portsmouth, R. I., will be started this year. Tank farms, it is reported, will require at least 10,000 tons of plates.

The Pressed Steel Division of Republic Steel Corp. will build 144 specially designed railroad car covers for the Nickel Plate. This is the largest order of its kind ever received by Republic.

Steel Bars . . .

Bar Prices, Page 146

The automakers are giving no indication of what tonnage they will require in second quarter. Sales to the auto builders have been declining over the past month but the barmakers think this trend will be reversed shortly when the expected seasonal upturn in auto business becomes evident.

Currently, commercial steel bar demand is a shade easier than it was some time back, but the mills are still behind on commitments. Requirements for the heavier sizes of flats and rounds are fairly active. In hot-rolled alloy bars, excepting nickel-bearing, the situation is somewhat reversed. Demand is not active, particularly for the larger sizes.

Cold-finished carbon bars are moving well. Hot-bar deliveries to the converters are improved. Cold-finished alloy bars, however, are not under pressure.

In New England, while some preliminary bar orders for early May shipment are being received for 1957 auto model schedules, current demand from area forge shops is off. Orders for screw machine products are holding up well.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 147 & 148

The market on galvanized sheets is fairly well saturated. Sales will rise in the second quarter with the usual increases in construction applications.

Cutbacks by the automotive industry have eased pressure somewhat on cold-rolled sheets. The demand for this product is roughly in balance with supply.

Some customers in other lines, less concerned about future supply than they were, are not taking all the tonnage offered by regular suppliers for April. They are the exception, and in no instance has there been a question as to producers being able to dispose of rejected tonnage. Producers can apply it to arrearages, if nowhere else, and most of them prefer to do so.

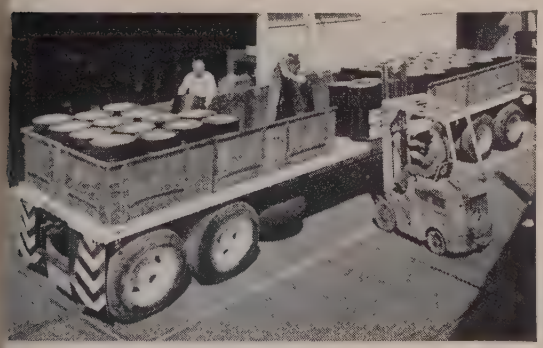
Most producers will enter the sec-

DOW TRICHLOROETHYLENE

Each order brings you service as efficient as the solvent itself

It's got to be quick to be good! Dow distributors . . . and their thousands of satisfied customers . . . know from experience that no other producer of vapor degreasing solvents gives more attention to *service* than Dow.

Three separate producing plants assure adequate *supply* of DOW TRICHLOROETHYLENE . . . and that's becoming particularly *important*. The six additional Dow shipping terminals mean that supply is *delivered* with dependable speed. And Dow distributors carefully maintain convenient warehouse stocks in all sections of the country.



DOW TRICHLOROETHYLENE saves you concern and expense in other vital ways, too. This solvent's stabilized uniformity gives you a smoother, trouble-free operation. Its rugged "work horse" cleaning characteristics generally result in decided savings on cost per run. Well-qualified, up-to-the-minute technical assistance is available on request. Better check your trichloroethylene supply *today*. The same distributor you'll want to contact for DOW TRICHLOROETHYLENE can help with your specialized solvent needs, too; he also gives quick delivery on superior, high-boiling DOW PERCHLOROETHYLENE (Industrial), METHYLENE CHLORIDE and the wonderfully versatile, new *cold* cleaner, CHLOROTHENE*. For full information on any or all of these efficient solvents, why not drop a line to THE DOW CHEMICAL COMPANY, Dept. S 940B, Midland, Michigan.

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job for the particular purpose for which it is to be used, without defects, burrs or camber to

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ond quarter with arrearages. For instance, one large mill in the East will have reduced arrearages on hot and cold-rolled sheets by half by the end of this quarter, but the mill still will have a carry-over of at least one month. It's doubtful that all second quarter demand for sheet and strip will be met. Hot-rolled sheet producers will have trouble filling orders already on the books for the next two months.

Opinion is mixed in the Chicago area as to whether automobile manufacturers will be taking their full quotas of cold-rolled sheets in May and June. One company which had canceled some of its April tonnage sought to reinstate the order. The attempt was not successful since this tonnage had been allotted to other consumers.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 149

Fastener manufacturers report their sales to the automotive industry are noticeably down. With bolts, nuts, rivets, etc., in good supply, there's little incentive for the auto buyers to order for stock at this time. Meanwhile, other classes of consumers are continuing to buy fasteners in substantial volume. Sales are expected to increase by the end of March for construction and farm applications.

Imported Steel Prices Firm

Except for merchant bars, which are off 30 cents per hundredweight, and wire rods, which are up 15 cents, prices on imported steel from western continental Europe are unchanged. The steadiness in the market reflects continued tight supply conditions abroad rather than sustained inquiry here.

Deliveries are too far extended for substantial buying by consumers on this side. Deliveries of bar size angles and hot-rolled sheets are a little easier at three to four months. Structural angles and wide flange beams are available in six to seven months. Plates can be had within four to six months, but, with prices around $8.50 per hundredweight at Atlantic and southern ports, these deliveries are not attracting much buying, despite the shortage of American plates.

Severe cold weather in Europe has slowed production to some extent.

Warehouse . . .

Warehouse Prices, Page 151

Users of plate and structural shapes are beginning to depend on warehouses as their main source of supply, but distributors have extreme difficulty obtaining these products. Strip and hot-rolled sheet are also tight, but warehouses are offering improved service in delivery of galvanized and cold-finished sheet. Some small bar sizes are extremely tight, while there's a loosening in supply of larger bars.

Leading distributors in the Philadelphia district declare they could use any surplus of hot and cold-rolled sheet tonnage that is floating around. They admit the tonnage probably would go to manufacturers first. They say their quotas on these products, as well as plates, shapes and hot carbon bars, haven't been boosted one iota by the mills. Their bookings are still limited by their mill intake.

With the active construction season beginning soon, demand will increase steadily through April. Fabricators are watching the labor situation closely; some may start accumulating inventories early in the second quarter against the possibility of curtailed steel production at midyear.

Some distributors in the Los Angeles district complain that larger mills

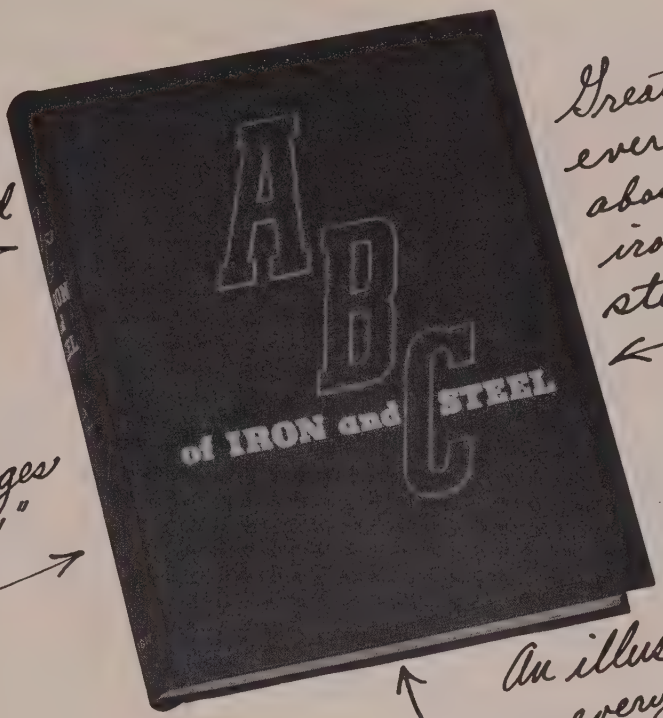
Steel Import Prices

(Base per 100 lb, landed, duty paid. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$6.80	$6.80	$6.80	$7.20
Bar Size Angles	6.80	6.80	6.80	7.20
Structural Angles	6.80	6.80	6.80	7.20
I-Beams	7.00	7.00	7.00	7.40
Wide Flange Beams	7.00	7.00	7.00	7.40
Plates	8.50	8.50	8.50	8.90
Sheets, H.R.	9.00	9.00	9.00	9.40
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	28.43	28.43	28.43	30.26
Barbed Wire (†)	6.10	6.10	6.10	6.45
Merchant Bars	*6.80*	*6.80*	*6.80*	*7.20*
Hot-Rolled Bands	7.10*	7.10*	7.10*	7.50*
Wire Rods, Thomas Commercial No. 5	*6.40*	*6.40*	*6.40*	*6.80*
Wire Rods, O-H Cold Heading Quality No. 5	*6.90*	*6.90*	*6.90*	*7.30*
Bright Common Wire Nails	7.50	7.50	7.50	7.90

Oil Country Pipe: Prices on all sizes equalized with Pittsburgh plus barge freight to New Orleans and Houston, where available.

*Nominal. †Per 82-lb, net, reel. §Per 100-lb kegs, 20d nails and heavier.



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Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.00
Mesabi nonbessemer	10.85
Open-hearth lump	12.10
High phos.	10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	26.00-28.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$34.00-$34.50
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.06-$1.11 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 95c-$1.00.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48%	2.8:1	nom. $45.00-$50.00
48%	3:1	42.00-44.00
48%	no ratio	34.00

South African Transvaal

44%	no ratio	$19.00-$20.00
48%	no ratio	33.00-35.00

Domestic

Rail nearest seller

18%	3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	*$1.10*

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.60-$3.85
60-65%	3.85-4.00

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.

Super-Duty: Ironton, O., St. Louis, $150

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., Hawstone, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.

Super Duty: Hays, Sproul, Hawstone, Pa., Warren, Windham, O., Athens, Tex., $145; Morrisville, Pa., Niles, O., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)

Clearfield, Pa., $139; Philadelphia, $124; Woodbridge, N. J., $122.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalia, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $194; Danville, Ill., $197; Philadelphia, Clearfield, Pa., $201.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $241; Danville, Ill., $244; Philadelphia, Clearfield, Pa., $248.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Clearfield, Pa., Philadelphia, $286.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)

Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $258.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ½-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅜-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.75-14.50
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Birmingham, ovens	$25.65
Cincinnati, deld.	30.58
Buffalo, ovens	27.50
Buffalo, deld.	28.75
Camden, N. J., ovens	26.50
Chicago, ovens	27.00
Chicago, deld.	28.50
Detroit, ovens	27.50
Detroit, deld.	28.50
Pontiac, deld.	29.06
Saginaw, deld.	30.58
Erie, Pa., ovens	27.50
Everett, Mass., ovens	
New England, deld.	*28.55
Indianapolis, ovens	26.75
Kearny, N. J., ovens	26.75
Lone Star, Tex., ovens	19.50
Milwaukee, ovens	27.50
Neville Island, (Pittsburgh) Pa., ovens	26.25
Painesville, O., ovens	27.50
Cleveland, deld.	29.43
Philadelphia, ovens	26.50
Portsmouth, O., ovens	24.75
Cincinnati, deld.	27.34
St. Paul, ovens	26.50
Swedeland, Pa., ovens	26.50
Terre Haute, Ind., ovens	26.75

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulphate	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-$39; 70%, $35-36; 60%, $31-$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length (Inches)	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5½	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

are increasing their operations in the "warehouse sphere of influence." The competition threatens to undercut warehouse prices, they say.

Tubular Goods . . .

Tubular Goods Prices, Page 150

Buttweld pipe is available for nearby shipment, but deliveries of lapweld are well extended. One mill has nothing to offer before June. Seamless pipe deliveries extend much further and appear limited only by what the mills are willing to schedule.

Line pipe production has been slowed by a shortage of semifinished steel. Order books are bulging, bookings assuring capacity mill operations for the next 18 months. In oil country goods, second quarter books are filling rapidly. Some buyers complain of a shortage of high-alloy pipe capacity.

Second quarter books are filling in seamless specialties and mechanical tubing.

The first shipment of pipe (1300 tons) for the West Coast Transmission Co.'s natural gas line in Canada has been received from the South Durham Steel & Iron Co., Stockton-on-Tees, England. The entire order involves 90,000 tons of fabricated 40-in. pipe.

Alloy Fabricators, division of the California Alloy Products Co., Los Angeles, has opened a pipe and tube fabricating shop equipped to make short runs on special pipe sizes.

Pig Iron . . .

Pig Iron Prices, Page 151

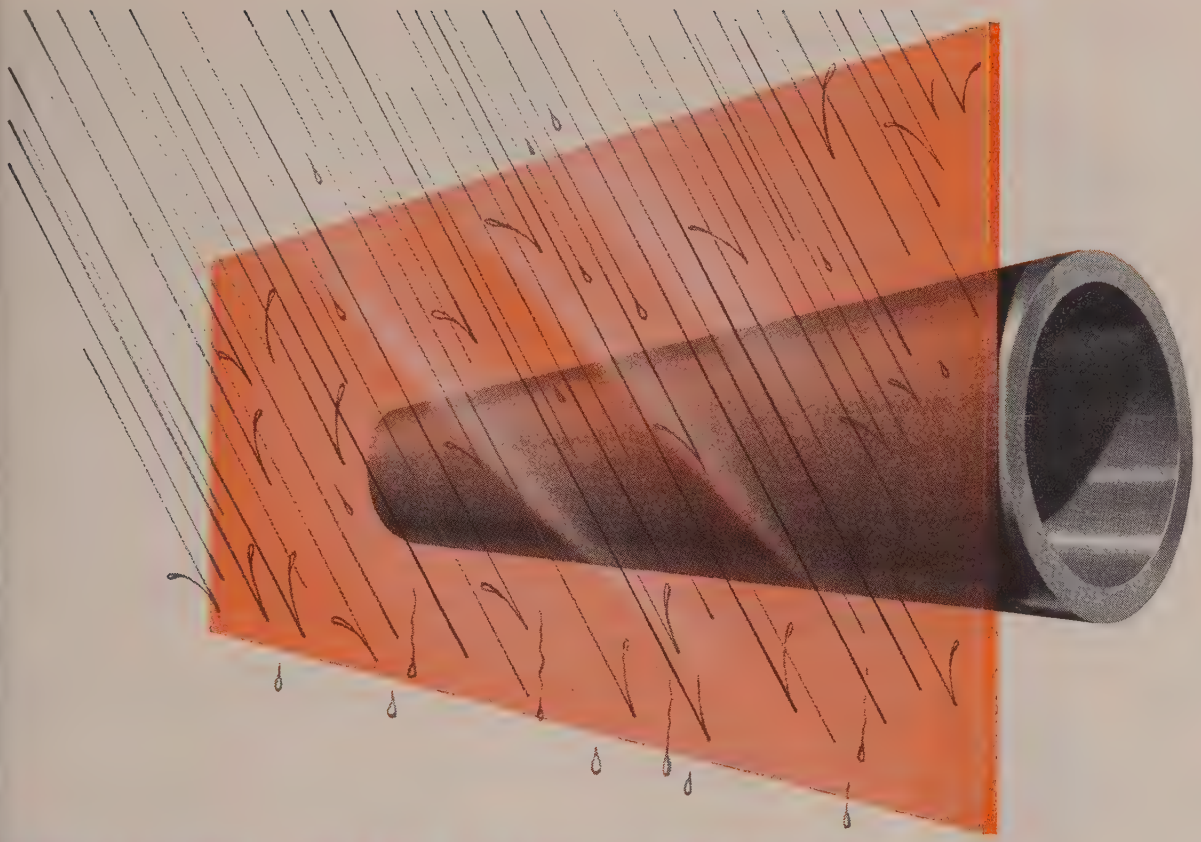
Automotive foundries are melting less iron than they did in the fourth quarter and have reduced their receipts of pig iron accordingly. Foundries making castings for the machine tool and other industries are ordering steadily.

Pig iron sellers have comfortable order backlogs and are looking for a satisfactory volume of business in the second quarter. This appraisal is based in part on the fact that gray iron foundries generally are operating between 85 and 100 per cent of capacity.

Some hedge buying against a price increase and a possible interruption of blast furnace operations due to labor trouble at midyear is reported. Supply of merchant pig iron appears adequate.

Republic Steel Corp. has withdrawn its published price on No. 2 foundry iron at its Alabama City, Ala., furnace, which now is on basic. The company continues to quote the

(*Please turn to page* 162)



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Freeway ball bearings install easily, permanently . . . thanks to a patented outer race that enables them to be snapped quickly, firmly into position. And they cost so little! Descriptive literature upon request.

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $94; 19-21% Mn, 1-3% Si, $91.50; 16-19% Mn, $89.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $205. Duquesne, Johnstown, Sheridan, Pa.; Philo, O.; Tacoma, Wash.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $213 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 30.95c per lb of contained Mn, carload packed 32c, ton lots 33.5c, less ton 34.7c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 22.35c per lb of contained Mn, packed, carload 23.4c, ton lot 25c, less ton 26.2c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 30c; 2000 lb to min carload, 32c; 250 lb to 1999 lb, 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.5c per lb of alloy. Packed, c.l. 12.5c, ton 12.95c, less ton 13.95c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N.Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 26.25c per lb of contained Cr; c.l. packed 27.5c, ton lot 29.25c, less ton 30.65c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 31.75c per lb contained Cr, 0.02% max 33.50c, 0.03% max 33c, 0.06% max 33.50c, 0.1% max 33c, 0.15% max 35.75c, 0.2% max 35.50c, 0.5% max 35.25c, 1.0% max 34c, 1.5% max 33.85c, 2.0% max 33.75c. Ton lot, add 3.1c, less ton add 4.8c. Carload packed add 1.45c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l. 2 in. x D, bulk 27.4c per lb contained Cr. Packed, c.l. 28.7c, ton 30.5c, less ton 32c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed 8 M x D, 19.6c per lb of alloy, ton lot 20.85c; less ton lot, 22.05c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 39.05c per lb of contained Cr; 1" x down, bulk 39.8c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2 max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.25 per lb, ton lots $1.27, less ton lots $1.29. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.20. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.33 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.75c per lb of contained Si. Packed, c.l. 14.85c, ton lot 16.3c, less ton 17.95c. F.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.2c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 14.5c per pound contained silicon. Packed, c.l. 16.2c, ton lots, 18c; less ton, 19.35c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 15.4c per lb of contained Si. Packed, c.l. 17.05c, ton lot 18.7c, less ton 19.95c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si. Packed, c.l. 19.95c, ton lot 21.35c, less ton 22.4c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 98% Si, 0.75% max Fe, 0.07 max Ca). C.l. lump, bulk, 20.5c per lb of Si. Packed, c.l. 21.95c, ton lot 23.25c, less ton 24.25c. Add 0.5c for max 0.03 Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lots packed 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 8.5c, per lb of alloy. Packed, c.l. 9.5c, ton lot 10.65c, less ton 11.5c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25c per lb of alloy, ton lot 27.4c, less ton 28.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D. $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 22c per lb of alloy, carload packed 23.05c, ton lot 24.95c, less ton 25.95c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 21.5c per lb or alloy, carload packed 22.95c, ton lot 25.25c, less ton 26.75c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅜ lb each and containing 2 lb of Cr). Contract, carload, bulk, 16.95c per lb of briquet, carload packed in box pallets 17.15c, in bags 17.85c; 3000 lb to c.l. in box pallets 18.35c; 2000 lb to c.l. in bags, 19.05c; less than 2000 lb in bags 19.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing 2 lb of Mn). Contract, carload, bulk 12.5c per lb of briquet, c.l. packed, pallets 12.7c, bags 13.5c; 3000 lb to c.l., pallets 13.9c; 2000 lb to c.l., bags, 14.7c, less ton 15.6c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing 2 lb of Mn and approx. ½ lb or Si). Contract, c.l. bulk 13.15c per lb of briquet, c.l. packed, pallets, 13.35c; bags 14.15c, 3000 lb to c.l., pallets, 14.55c; 2000 lb to c.l., bags, 15.35c; less ton 16.25c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.15c per lb of briquet; packed, pallets, 7.35c; bags, 8.15c; 3000 lb to c.l., pallets, 8.95c; 2000 lb to c.l. bags 9.75c; less ton 10.65c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing 1 lb of Si). Carload, bulk 7.3c. Packed, pallets 7.5c; bags 8.30c; 3000 lb to c.l. pallets 9.1c; 2000 to c.l. bags 9.9c; less ton 10.8c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.33 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.45 per lb of contained W; 2000 lb W to 5000 lb W, $3.55; less than 2000 lb W, $3.67. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min C 0.30% max). Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, delivered; less ton lots $4.70.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.) Contract, c.l. packed ½ in. x 12 M, 18.5c per lb of alloy, ton lots 19.65c, less ton 20.9c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18.5c per lb of alloy, ton lots 19.65c; less ton lots 20.9c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 17.2c per lb of alloy; ton lots 18.7c; less ton lots 19.95c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 17.50c. Packed c.l. 18.50c, 200 lb to c.l. 19.50c, less than 2000 lb 20c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base; caload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.54 in all sizes except powdered which is $1.66; Washington, Pa., furnace, any quantity $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa.; $1.31 in cans; in bags, $1.30, f.o.b. Langeloth, Pa.; $1.24, Washington, Pa.

(*Concluded from page* 158)

foundry grade at Birmingham, Cleveland, Buffalo and Troy, N. Y.

Automotive foundries in the Chicago area are melting less iron than they did in fourth quarter and have cut back on their iron shipments accordingly. In the district, 43 blast furnaces are in operation.

Wire . . .

Wire Prices, Pages 148 & 149

Demand for low carbon wire used in fabric, mesh, pipe reinforcing and highway accessories is heavier. Mill backlogs are reported extended. Most mesh items are on a monthly quota basis. The higher carbon grades, manufacturers wire, heading and spring grades appear to be in slightly less active demand. Inventories are up and some deferments are noted with consumers more prone to delay placements with the mills, evidently under less pressure for tonnage than formerly. With the approach of spring, some quickening in merchant products requirements is under way.

Wire rods are in short supply. Producers haven't closed books for second quarter, but they are confident customers will specify all the tonnage they are entitled to under existing order patterns.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 158

Coke production in the U. S. totaled 75,158,839 net tons in 1955, reports the U. S. Bureau of Mines. This was 26 per cent above 1954 output. Of the total, 73,455,250 tons were oven coke and 1,703,579 beehive.

Oven output fell short of the record set in 1953 by only 138,278 net tons. Production at merchant plants averaged 84.4 per cent of capacity, compared with 60.7 in 1954. The rate at furnace plants was 94.7 per cent.

Beehive ovens produced almost three times as much coke as they did in 1954, but output was only about one-fourth as much as was turned out each year during the Korean War. Lack of satisfactory coking coal caused many plants with serviceable ovens to remain idle.

Here are comparative production data:

OVEN COKE PRODUCTION BY STEEL DISTRICTS
(Net Tons)

Districts	1954	1955
Eastern	12,936,243	15,406,568
Pittsburgh-Youngstown	19,953,889	25,069,354
Cleveland-Detroit	5,860,418	8,594,749
Chicago	11,760,680	14,242,145
Southern	6,152,790	7,193,189
Western	2,287,397	2,949,245
Total	58,951,417	73,455,250

BEEHIVE COKE PRODUCTION BY REGIO-
(Net Tons)

Regions	1954	1955
Pennsylvania	401,546	1,298,[illegible]
West Virginia	36,991	114,[illegible]
Other (Kentucky, Utah, Virginia)	127,060	290,[illegible]
Total	565,597	1,703,[illegible]

More than 1 million tons of ov coke were withdrawn from produ ers' stocks during 1955, the total year end amounting to 1,747,536 ton against 2,941,571 at the close of 195

The major use, as in former year was for the reduction of iron ore i blast furnaces. About 89 per cent c total distribution was for this pur pose, up 31 per cent from the yea before. The blast furnaces and found ries, together, used 93 per cent c the total tonnage consumed durin the year. Use for gas manufactur and residential heating decreased.

Comparative consumption data:

DISPOSAL OF COKE BY USES
(Net Tons)

	1954	1955
Blast furnace plants	51,961,053	68,149,89
Foundries	2,479,321	3,159,12
Producer-gas plants	342,148	231,74
Water-gas plants	1,091,283	994,28
Other industrial plants	1,860,130	2,277,03
Residential heating	1,248,347	1,154,21
Exports	298,534	325,05
Total	59,280,816	76,291,35

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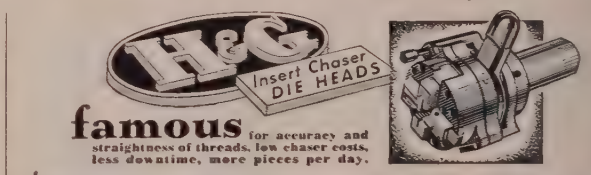
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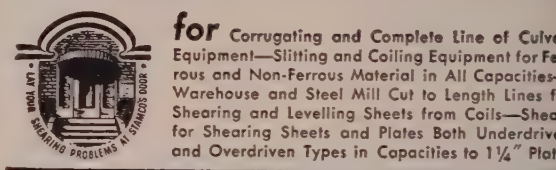
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Scrap . . .

Scrap Prices, Page 164

Philadelphia—Recent buying by the Fairless, Pa., consumer of No. 1 heavy melting, No. 1 bundles and No. 1 busheling at $50, delivered, has been followed by modest buying by others at the same level. This reflects a slight downtrend. Mills also have purchased No. 2 heavy melting at $44, up slightly, and No. 2 bundles at $41, unchanged on an average basis.

Mixed borings and turnings are off 50 cents to $36, and machine shop turnings and short shovel turnings are down $1 to $35 and $38, respectively. Heavy turnings are easier at $46, and couplers, springs and wheels are $58, off $1.

No. 1 cupola and heavy breakable cast are down $1 to $49 and $52, respectively. Other cast grades are unchanged; also low phos structurals and plates, electric furnace bundles and rail crops.

Pittsburgh—A major buyer bought No. 1 heavy melting scrap at $48 last week, and paid $44 for No. 2 heavy melting. This confirms the price paid earlier by another mill. Railroad scrap prices are slightly firmer.

Boston—Steel scrap prices have levelled off here with borings and turnings steadier. For district consumption, small new orders for No. 1 heavy melting and busheling have brought brokers' buying prices $41, shipping point. This is $7 per ton off from early January. Little tonnage is moving to dock on export account.

New York—Brokers' buying prices on the prime grades of open-hearth scrap have stiffened to $43-$44 although the market on No. 2 heavy melting and No. 2 bundles is unchanged. Machine shop turnings are up $1 to $25-$26.

Broadly, trading in the steel grades is a little more active, but on a moderate scale, as consumers are not sure that the downtrend of recent weeks is over. They anticipate a leveling off for the present, but are bearing in mind that spring is not far off and that at that time there is usually an easing in supply due to more favorable weather for shipments.

Cincinnati—The scrap market is quiet here. Prices are unchanged and demand is sluggish. Flood conditions on the Ohio river curtailed barge movement of scrap for a time last week.

Chicago — A district steel mill bought No. 2 bundles for $26, delivered, putting this item back in line with the other steelmaking grades of scrap. The price was $3 per ton lower than what mills paid on their last purchases a month ago but was only $1 under the recently prevailing market. Several other grades were acquired at unchanged prices. None of the acquisitions involved big tonnage, but together, they served to keep the market stabilized. A few railroad grades are stronger by $1 a ton.

Cleveland—The scrap market is firm here, with a fair volume of business reported done both here and in the Valley. No. 1 heavy melting is unchanged at $49-$50, but No. 2 heavy melting is up about $2 per ton to $45-$46. The low phos items are up $1. Some railroad items are off $1 to $2. The auto lists brought slightly higher prices than they did a month ago. They are up about 50 cents per ton.

Detroit—Scrap prices are unchanged here. Auto lists closed about $1 off from a month ago, however. The market is quiet. Rotary Electric Steel Co. has been out of the market because of a wildcat strike. Ingot operations in the area are estimated at 102 per cent, compared with 88 a year ago.

Birmingham—Steady demand for steel scrap for electric furnace use and for export is keeping the price of No. 1 heavy melting steady. No. 2 heavy melting and No. 2 bundles are off $2 per ton.

St. Louis—Railroad scrap prices tumbled $1 to $2 a ton on all grades except angles and splice bars. Sales are sluggish. The mills hold large inventories and some of them are out of the market for scrap. Others have decreased buying and are showing little interest.

Los Angeles—Continuing the trend toward lower prices, No. 1 cupola cast dropped $2 to $46 last week. Although prices on other grades held unchanged, dealers reported definite easing in the market.

San Francisco—Steel scrap is in such plentiful supply that dealers are predicting another downward price adjustment within the next week or so. Local dealers are watching developments in the export market closely.

Seattle—Scrap is weaker and further downward price adjustments are expected. Mills hold large inventories, while foreign buyers are not displaying much interest in offerings. Country shippers are holding up shipments with the result that yard receipts are off. No. 1 and No. 2 heavy melting are quoted at $42 and $38, respectively. No. 2 bundles are down to $27, while electric furnace material is quoted at $48.

Canada . . .

Iron and steel production in Canada set new records in 1955.

Production of steel ingots and castings totaled 4,529,401 net tons. This compares with 3,194,122 net tons in 1954 and 4,115,469 tons in 1953.

Production included 4,441,743 tons of steel ingots and 87,658 tons of steel castings, against 3,113,822 tons of ingots and 80,300 tons of castings in 1954, and 4,009,813 tons of ingots and 105,656 tons of castings in 1953.

(*Please turn to page* 166)

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported by STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Feb. 29	$48.17
Feb. 22	48.33
Jan. Avg.	52.17
Feb. 1955	36.79
Feb. 1951	44.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	47.00-48.00
No. 2 heavy melting	43.00-44.00
No. 1 bundles	47.00-48.00
No. 2 bundles	40.00-41.00
No. 1 busheling	47.00-48.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	33.00-34.00
Short shovel turnings	36.00-37.00
Cast iron borings	36.00-37.00
Cut structurals, 3 ft lengths	56.00-57.00
Heavy turnings	44.00-45.00
Punching & Plate scrap	56.00-57.00
Electric furnace bundles	52.00-53.00

Cast Iron Grades

No. 1 cupola	48.00-49.00
Charging box cast	45.00-46.00
Heavy breakable cast	45.00-46.00
Unstripped motor blocks	32.00-33.00
No. 1 machinery cast	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt	*54.00-55.00*
Rails, 2 ft and under	*66.00-67.00*
Rails, 18 in. and under	*67.00-68.00*
Rails, random lengths	*62.00-63.00*
Railroad specialties	60.00-61.00

Stainless Steel Scrap

18-8 bundles & solids	340.00-350.00
18-8 turnings	235.00-245.00
430 bundles & solids	110.00-120.00
430 turnings	60.00-65.00

CLEVELAND

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	*45.00-46.00*
No. 1 bundles	49.00-50.00
No. 2 bundles	38.00-39.00
No. 1 busheling	49.00-50.00
Machine shop turnings	29.00-30.00
Mixed borings, turnings	33.00-34.00
Short shovel turnings	33.00-34.00
Cast iron borings	33.00-34.00
Low phos.	*55.00-56.00*
Cut structural plates 2 ft and under	*55.00-56.00*
Alloy free, short shovel turnings	37.00-38.00
Electric furnace bundles	*50.00-51.00*

Cast Iron Grades

No. 1 cupola	54.00-55.00
Charging box cast	47.00-48.00
Stove plate	52.00-53.00
Heavy breakable cast	46.00-47.00
Unstripped motor blocks	36.00-37.00
Brake shoes	41.00-42.00
Clean auto cast	*54.00-55.00*
Burnt cast	41.00-42.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	53.00-54.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	*67.00-68.00*
Rails, 18 in. and under	*68.00-69.00*
Rails, random lengths	*61.00-62.00*
Cast steel	*58.00-59.00*
Railroad specialties	*58.00-59.00*
Uncut tires	*59.00-60.00*
Angles, splice bars	*62.00-63.00*
Rails, rerolling	67.00-68.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	340.00-350.00
18-8 turnings	200.00-210.00
430 clips, bundles, solids	105.00-115.00
430 turnings	55.00-65.00

YOUNGSTOWN

No. 1 heavy melting	52.00-53.00
No. 2 heavy melting	*41.00-42.00*
No. 1 bundles	52.00-53.00
No. 2 bundles	*38.00-39.00*
No. 1 busheling	52.00-53.00
Machine shop turnings	*29.00-30.00*
Short shovel turnings	*34.00-35.00*
Cast iron borings	*34.00-35.00*
Low phos.	53.00-54.00
Electric furnace bundles	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	*53.00-54.00*

CHICAGO

No. 1 heavy melting	46.00-48.00
No. 2 heavy melting	37.00-38.00
No. 1 factory bundles	48.00-49.00
No. 1 dealer bundles	45.00-46.00
No. 2 bundles	*35.00-36.00*
No. 1 busheling	46.00-48.00
Machine shop turnings	25.00-26.00
Mixed borings, turnings	27.00-28.00
Short shovel turnings	27.00-28.00
Cast iron borings	27.00-28.00
Cut structurals, 3 ft	52.00-53.00
Punchings & plate scrap	53.00-54.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Stove plate	38.00-39.00
Unstripped motor blocks	36.00-37.00
Clean auto cast	51.00-52.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00-50.00
R.R. malleable	58.00-59.00
Rails, 2 ft and under	*63.00-64.00*
Rails, 18 in. and under	*64.00-65.00*
Angles, splice bars	*61.00-62.00*
Rails, rerolling	*65.00-66.00*

Stainless Steel Scrap

18-8 bundles & solids	325.00-340.00
18-8 turnings	230.00-240.00
430 bundles & solids	105.00-110.00
430 turnings	45.00-50.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	45.00
No. 2 heavy melting	32.00
No. 1 bundles	45.00
No. 2 bundles	33.00
No. 1 busheling	45.00
Machine shop turnings	22.00
Mixed borings, turnings	22.00
Short shovel turnings	25.00
Punching & plate scrap	54.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	37.00
Stove plate	37.00
Heavy breakable	35.00
Unstripped motor blocks	25.00
Clean auto cast	46.00
Malleable	42.00

BIRMINGHAM

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	*37.00-38.00*
No. 1 bundles	41.00-42.00
No. 2 bundles	*28.00-29.00*
No. 1 busheling	41.00-42.00
Cast iron borings	*20.50-21.50*
Short shovel turnings	30.00-31.00
Machine shop turnings	29.00-30.00
Electric furnace bundles	44.00-45.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.50-48.00
Stove plate	44.50-45.50
Bar crops and plate	51.00-52.00
Structural & plate, 2 ft.	*50.00-51.00*
Unstripped motor blocks	*37.00-38.00*
Charging box cast	32.00-33.00
No. 1 wheels	*37.00-38.00*

Railroad Scrap

No. 1 R.R. heavy melt	*47.00-48.00*
Rails, 18-in. and under	*61.00-62.00*
Rails, rerolling	*61.00-62.00*
Rails, random lengths	58.00-59.00
Angles, splice bars	57.00-58.00

PHILADELPHIA

No. 1 heavy melting	*50.00*
No. 2 heavy melting	*44.00*
No. 1 bundles	*50.00*
No. 2 bundles	*41.00*
No. 1 busheling	*50.00*
Electric furnace bundles	52.00-53.00‡
Mixed borings, turnings	*36.00*
Machine shop turnings	*35.00*
Short shovel turnings	*38.00*
Heavy turnings	*46.00*
Structurals & plate	54.00-56.00
Couplers, springs, wheels	*58.00*
Rail crops, 2 ft & under	64.00-65.00†

Cast Iron Grades

No. 1 cupola	*49.00*
Malleable	68.00
Heavy breakable cast	*52.00*
Drop broken machinery	54.00-55.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	37.00-38.00
No. 1 bundles	*43.00-44.00*
No. 2 bundles	32.00-33.00
Machine shop turnings	*25.00-26.00*
Mixed borings, turnings	27.00-28.00
Short shovel turnings	29.00-30.00
Low phos. (structural & plate)	45.00-46.00†

Cast Iron Grades

No. 1 cupola	43.00-44.00
Unstripped motor blocks	30.00-32.00
Heavy breakable	45.00-46.00

Stainless Steel

18-8 sheets, clips solids	320.00-325.00
18-8 borings, turnings	150.00-160.00
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

‡Nominal

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*41.00*
No. 2 heavy melting	32.00-33.00
No. 1 bundles	38.00-39.00
No. 2 bundles	30.00-31.00
No. 1 busheling	*41.00*
Machine shop turnings	23.00-23.50
Mixed borings, turnings	26.00-26.50
Short shovel turnings	27.00-28.00
No. 1 cast	40.50-41.00
Mixed cupola cast	38.00-39.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	40.00-41.00
No. 1 bundles	46.00-47.00
No. 2 bundles	37.00-38.00
No. 1 busheling	46.00-47.00
Mixed borings, turnings	29.00-30.00
Machine shop turnings	28.00-29.00
Short shovel turnings	30.00-31.00
Cast iron borings	30.00-31.00
Low phos.	46.00-47.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	46.00-47.00
No. 1 machinery	49.00-50.00

Railroad Scrap

Rails, random lengths	60.00-61.00
Rails, 3 ft and under	62.00-63.00
Railroad specialties	54.00-55.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	36.00-37.00
No. 1 bundles	45.00-46.00
No. 2 bundles	34.00-35.00
No. 1 busheling	45.00-46.00
Machine shop turnings	29.50-30.50
Mixed borings, turnings	30.00-31.00
Short shovel turnings	31.50-32.50
Cast iron borings	30.00-31.00
Low phos., 18 in.	54.00-55.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00
Rails, 18 in. and under	65.00-66.00
Rails, random lengths	58.00-59.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	4
No. 2 heavy melting	3
No. 1 bundles	4
No. 2 bundles	3
No. 1 busheling	4
Machine shop turnings	2
Short shovel turnings	2

Cast Iron Grades

No. 1 cupola	4
Charging box cast	4
Heavy breakable cast	3
Unstripped motor blocks	3
Brake shoes	4
Clean auto cast	4
Stove plate	*4*

Railroad Scrap

No. 1 R.R. heavy melt	*4*
Rails, 18 in. and under	*6*
Rails, random lengths	*5*
Rails, rerolling	*6*
Angles, splice bars	54

SEATTLE

No. 1 heavy melting	42.
No. 2 heavy melting	38.
No. 1 bundles	34.
No. 2 bundles	*27.*
No. 3 bundles	25.
Machine shop turnings	15.00-16.
Mixed borings, turnings	15.00-16.
Short shovel turnings	15.00-16.
Electric furnace, bundles	*48.*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-43.
Heavy breakable cast	38.
No. 1 wheels	35.
Unstripped motor blocks	33.
Clean motor blocks	40.
Stove plate (f.o.b. plant)	35.
Brake shoes	35.

Railroad Scrap

Rails, random lengths	33.

LOS ANGELES

No. 1 heavy melting	42.0
No. 2 heavy melting	*36.0*
No. 1 bundles	*39.0*
No. 2 bundles	*32.0*
Machine shop turnings	*18.0*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*46.0*

SAN FRANCISCO

No. 1 heavy melting	40.0
No. 2 heavy melting	35.0
No. 1 bundles	39.0
No. 2 bundles	32.0
No. 1 busheling	40.0
Machine shop turnings	23.0
Mixed borings, turnings	23.0
Cast iron borings	23.0
Short shovel turnings	25.0
Cut structurals	49.0
Heavy turnings	23.0
Punching & Plate scrap	44.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	35.00
Stove plate	39.00
Heavy breakable cast	36.00
Unstripped motor blocks	32.00
Brake shoes	35.00
Clean auto cast	50.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	50.00

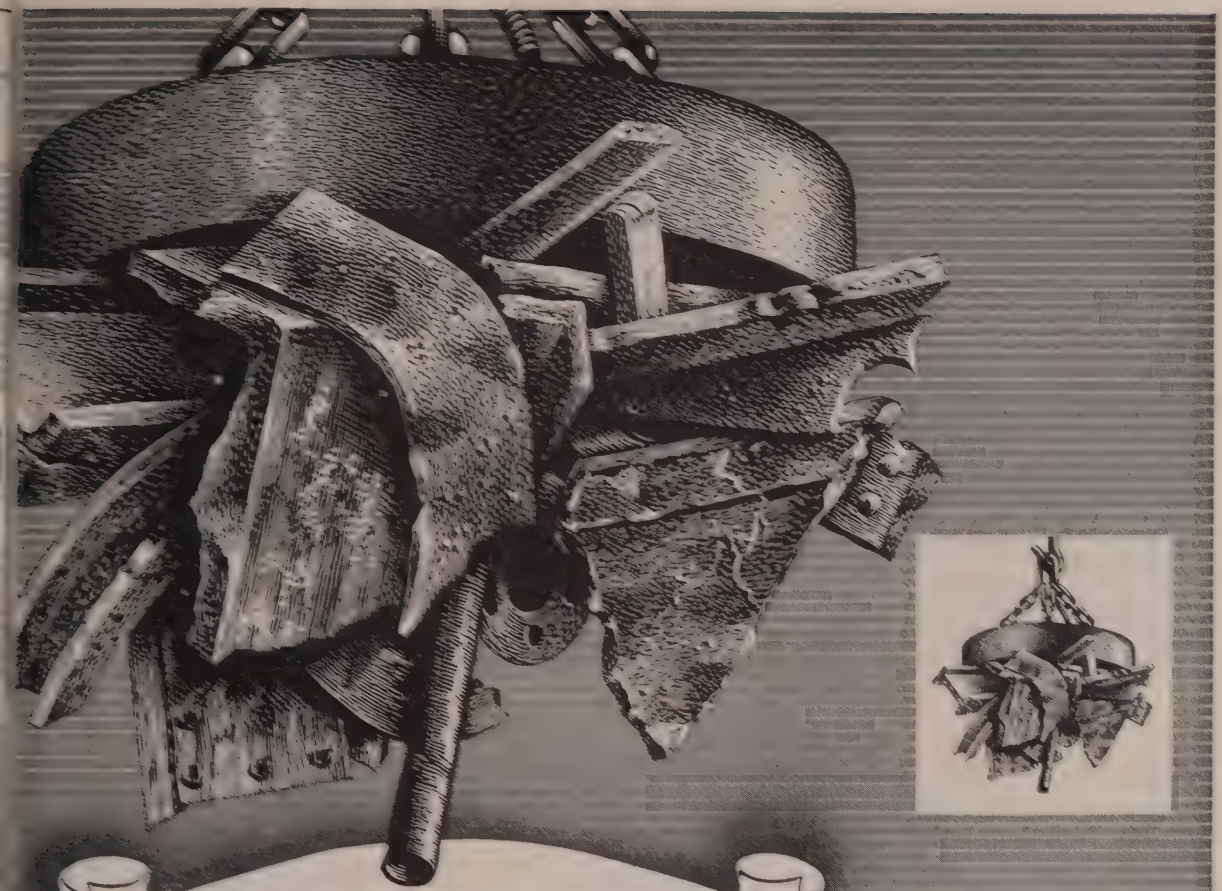
HAMILTON, ONT.

No. 1 heavy melting	45.50
No. 2 heavy melting	41.50
No. 1 bundles	45.50
No. 2 bundles	38.00
Mixed steel scrap	38.00
Mixed borings, turnings	19.00
Rails, remelting	54.50
Busheling, new factory: Prepared	43.50
Unprepared	39.50
Short steel turnings	27.50

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



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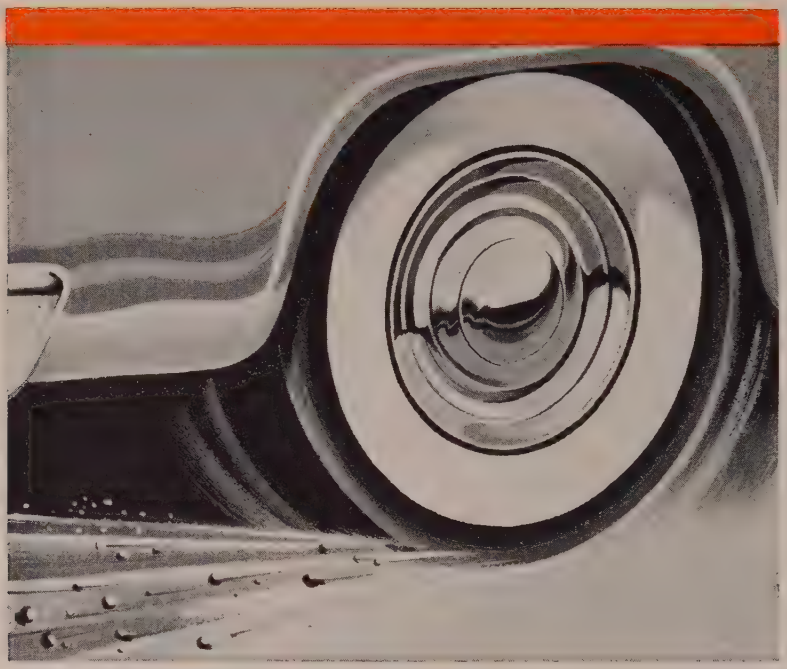

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(*Concluded from page* 163)

Production of steel ingots and castings in December, 1955, amounted to 423,127 net tons, against 415,477 tons in November and 275,072 tons in December, 1954.

Pig iron production in 1955 totaled 3,213,764 net tons, which was 84.1 per cent of total capacity, and compares with 2,213,433 tons, or 57.9 per cent, for 1954, and 3,012,269 tons, or 78.8 per cent, in 1953, the previous record year.

Production of pig iron for December amounted to 281,935 tons, or a daily average of 86.9 per cent.

Structural Shapes . . .

Structural Shape Prices, Page 146

While considerable structural work is before the trade, awards currently are slower. This is partly due to the sold-up condition of fabricating shops, notably in the East. Leading fabricators are booked a year ahead, in some cases farther, and many of the smaller shops have little open capacity under seven or eight months.

Because of this tight situation, there is considerable shopping around by builders and some changing of construction plans, particularly in financing. This tends to defer action on proposed work. However, the market continues fairly active. In the East, highway work is outstanding, notably in Connecticut.

Despite the current spottiness, much business is in the offing and is expected to come out as spring nears. Meanwhile steel supply continues as tight as ever. One producer, in line with action taken some time ago by another shapemaker, is limiting light wide flange sections, 30 lb and less, to no more than 10 per cent of total quotas.

Supply improvement is seen during the last half of this year when Bethlehem's Saucon mill is due to produce close to 210,000 tons monthly. Its capacity will be increased by 800,000 tons annually, and the rehabilitated mill will enlarge its wide-flange beam output substantially.

Fabricated structural steel prices in New England, notably on tonnage for delivery late this year and in early 1957, are higher, estimates taking into consideration an expected increase in structural shape prices by the mills around midyear. Many forward contracts include escalator clauses, but the shops anticipate an advance of at least $6 per ton.

Fabricated structural steel contracts placed in New England during February totaled 40,000 tons, highest for any single month on record.

The city of Chicago will take bids around Mar. 10 for 55,000 tons of structurals for the Calumet Skyway

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Qualifications will include 4 years' or more experience in mechanical design of pressure vessels and heat exchangers. Applicant should have a thorough knowledge of the ASME Code for Unfired Pressure Vessels and be familiar with fabrication and shop practices. Salary commensurate with ability and experience. Send resume.

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Manitowoc Crane, 50-60T., serial No. 3520. Equipped with 100' boom, powered by Caterpillar D-17000 diesel, crawler mounted. ECA rebuilt.

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Industrial Brownhoist Locomotive Crane, 35-40T., Model 8, serial No. 11401. 50' boom, powered with Caterpillar D-13000 diesel. Capacity at 12' radius, 70,000 lbs. without outriggers, 84,000 lbs. with outriggers. ECA rebuilt.

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1—LORAIN CRAWLER CRANE—Mdl. 78, —1½ yd., fully revolving. Powered by 6 cyl., Cat. Diesel D-13000. Complete with fairlead and 50' boom, with 20' extra boom section included. Cap. at 12' radius, 50 tons. In good operating cond. Located at Chicago. Priced to sell—$16,000.

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toll bridge. This will be the first of 11 contracts to be sought for construction of the skyway to run from 105th street and Indianapolis boulevard to 66th and State streets. Target date for completion is Jan. 1, 1958. The project will cost $88 million, of which $25 million will be for steel.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

12,125 tons, including 717 tons of low alloy steel, superstructures, three viaducts, Burr road, Cherry street and South avenue, Connecticut turnpike project 310-02, Bridgeport, Conn., to American Bridge Division, U. S. Steel Corp., Pittsburgh; bids Feb. 20, Hartford, Conn.; also 1200 tons, concrete reinforcing bars.

11,420 tons, including 3270 tons of low alloy steel, superstructure, main span, Quinnipiac river, 3769.26 linear ft, Connecticut turnpike project 317-05, New Haven, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; bids Feb. 20, Hartford, Conn.; also 1285 tons, concrete reinforcing bars.

5055 tons, including 3405 tons of low alloy steel, superstructure, Yellow Mill Pond bridge, 1330.52 linear ft, and superstructures, Stratford avenue and Beardsley street bridges, Connecticut turnpike project 312-02, Bridgeport, Conn. to Harris Structural Steel Co., New York; bids Feb. 20, Hartford, Conn.; also 800 tons, concrete reinforcing bars.

3500 tons, seven state bridges, Southeast expressway, Neponset Circle to river, Granite street, Dorchester district, Boston; to West End Iron Works, Cambridge, Mass.; M. DeMatteo Construction Co., Quincy, Mass., general contractor.

2200 tons, power plant addition, Connecticut Light & Power Co., Devon, Conn., through United Engineers & Constructors, Philadelphia, to Bethlehem Fabricators, Bethlehem, Pa.

1000 tons, wood mill, Rayonier Inc., Grays Harbor, Wash., to Pacific Car & Foundry Co., Seattle.

240 tons, state bridge, route 42, sections 14-B and 15-A, Camden county, N. J., through Public Constructors Inc., general contractor, to Phoenix Bridge Co., Phoenixville, Pa.

STRUCTURAL STEEL PENDING

2900 tons, county-city building, Tacoma, Wash.; Macdonald Building Co., Tacoma, low bidder at $5,620,627 (above estimate).

2635 tons, 15 grade separations, three stream crossing bridges and four reinforced concrete

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COMMISSION MANUFACTURERS REPRESENTATIVE

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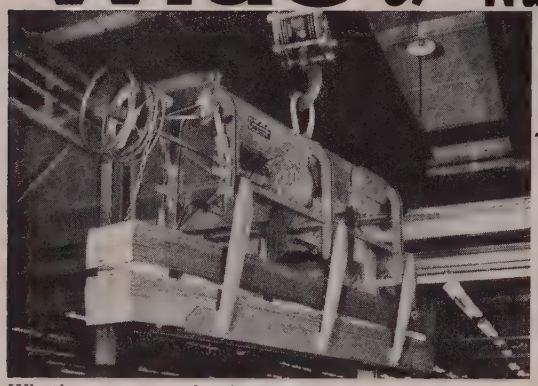

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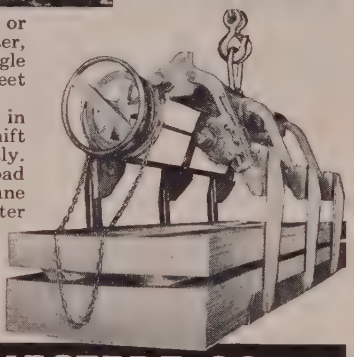

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Washington Steel *Corporation*

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culverts, Connecticut turnpike project 32[illegible] 01, Guilford-Clinton-Madison and Westbrook Conn.; Lane Construction Co., Meriden Conn., low on general contract; also 17[illegible] tons, concrete reinforcing bars and 13[illegible] tons, steel piles; bids Feb. 20, Hartford Conn.

1650 tons, five grade separations and three substructures for viaducts, Connecticut turnpike project 310-01, Fairfield and Bridgeport, Conn.; Cayuga Foundation Corp., New York, low on general contract; also 457 tons, steel piles, and 1150 tons, concrete reinforcing bars.

1245 tons, eight grade separations and two drainage structures, Connecticut turnpike project 302-02, Greenwich, Conn.; Slattery Contracting Co., New York, low on general contract; also 1125 tons, steel piles, and 1000 tons, concrete reinforcing bars.

600 tons, public school No. 111, Manhattan, New York; bids asked.

300 tons, jail equipment, county-city building, Tacoma, Wash., Decatur Iron & Steel Co., Decatur, Ala., low bidder at $379,843.

220 tons, Washington state undercrossing, Thurston county; Erickson Paving Co., Bellevue, Wash., low bidder at $578,858.

200 tons, state highway bridge, Coventry, West Warwick, R. I.; Campanella & Card Construction Co., Hillsgrove, R. I., low on general contract.

100 tons or more, Alaska railroad enginehouse; bids to Irvin P. Cook, chief engineer, Anchorage, Alaska, Mar. 21.

100 tons, radial and slide gates, etc., 16-mile branch lateral project, Ephrata, Wash.; West Coast Construction Co., Seattle, is low bidder at $459,297.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1800 tons, section, Schuykill expressway, Philadelphia, through Lipsett Inc., New York, general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

585 tons, substructure, Norwalk river bridge, Connecticut turnpike project 306-08, Norwalk, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Mariani Construction Co., New Haven, Conn., general contractor; 1675 tons, steel piles, to Bethlehem Steel Co., Bethlehem, Pa.

190 tons, including 160 tons for Seattle theater and 30 tons for construction at Toppenish, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

1600 tons, Pelton power project, Deschutes river, Oreg.; bids Mar. 16 to Portland General Electric Co., Portland, Oreg.

1300 tons, county-city building, Tacoma, Wash.; bids in.

450 tons, high school, Framingham, Mass.; M. S. Kelliher Co., Boston, is low on the general contract.

160 tons, concrete box culvert and drainage, West Springfield, Mass.

130 tons, Washington state undercrossing, Thurston county; bids in.

125 tons, overpass and interchange, F. E. Everett turnpike, Hooksett, N. H.; bids Mar. 8, Concord, N. H.; also 70 tons of structural steel.

107 tons, Washington state undercrossing, Spokane, Wash.; bids to Olympia, Wash., Mar. 6.

92 tons, furnished by Bonneville Power Administration; tower steel and footings for the McNary dam switchyard line; bids to Portland, Oreg., Mar. 15.

40 tons, also miscellaneous steel, Bureau of Roads, Baker river bridge, Washington state; American Pile Driver Co., Everett, Wash., awarded contract at $143,136.

Unstated, Yellowstone county courthouse, Billings, Mont.; Hitz Construction Co., Billings, is low at $1,634,130.

PLATES . . .

PLATES PLACED

90,000 tons, 40-in.-diameter, 0.375-in.-thick, natural gas pipe to the South Durham Steel & Iron Co. Ltd., Stockton-on-Tees, England, by the West Coast Transmission Co., Vancouver, B. C.

120 tons, city water storage tank, Othello, Wash., to American Pipe & Construction Co., Portland, Oreg., low bidder at $55,101.

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- CUSTOM CUT FROM YOUR BLANKS
- HEAT-TREATED, CASE OR FLAME-HARDENED

SIMONDS GEAR produces a complete line of industrial cut gears in a full range of sizes from cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite. Also heat-treated, case or flame-hardened carbon or alloy steel. Or, you may have your own gear blanks custom cut to your order. Same quality . . . same prompt service. Send us your requirements for quotation.

ALSO stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

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WORMS • WORM GEARS
RACKS
PINIONS

SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA.
Quality Gears for over 60 years

The Harbormaster, is a king-size power unit designed for rough use aboard barges, dredges and work boats. An Airco Oxygraph is a key production tool used to quickly and economically flame cut over 25 of its component parts from heavy steel. Airco electrodes—the Easyarc 12—are depended upon for the utmost in strength and welding speed.

Airco Electrodes & Cutting Machines

satisfy design and strength needs for unique outboard engine

The Mathewson Machine Works Inc., have been manufacturers of marine equipment since 1885. They find in building the Harbormaster that the extensive use of Airco electrodes, cutting equipment and industrial gases combine to provide them with the greatest degree of production flexibility and the widest margin of economy.

From planning to production you can rely on assistance—and completely unbiased recommendations—from Airco Technical men. For Airco is the leading supplier—manufacturer of all kinds and every type of welding and flame cutting processes, their controls, supplies and accessories.

Write to Airco for free literature on electrodes, cutting apparatus, and cutting machines.

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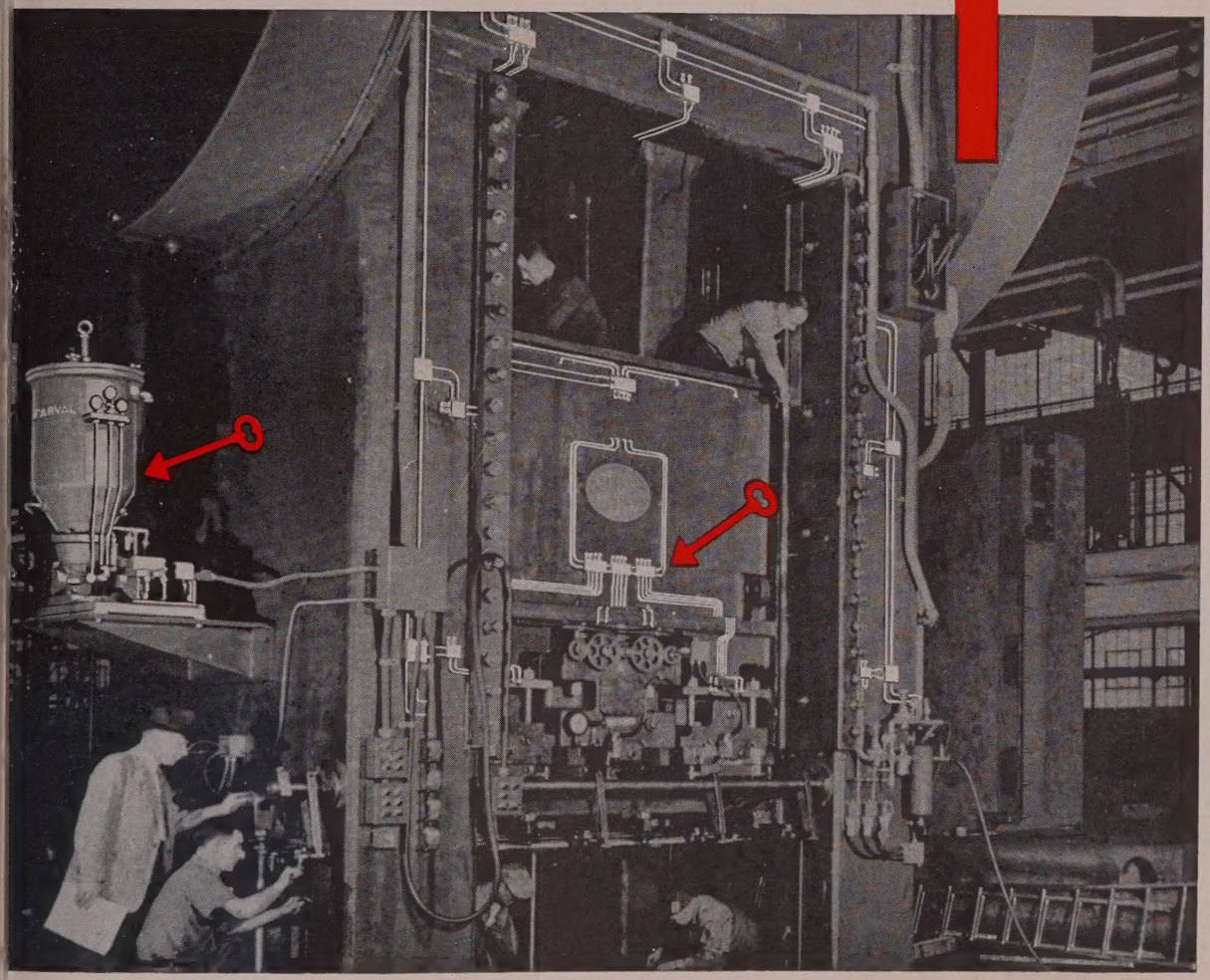
Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** — carbon dioxide, liquid-solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetates, alcohols, and other synthetic resins.

Farval guards bearings as press pierces projectiles from hot billets

FARVAL—
Studies in Centralized Lubrication
No. 187



KEYS TO ADEQUATE LUBRICATION—
Wherever you see a Farval central pumping station, dual lubricant lines and valve manifolds, you know a machine is being properly lubricated.

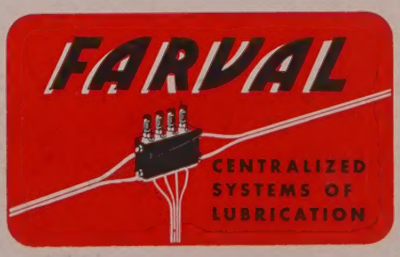
Photo shows workmen assembling Bliss Projectile Press, Farval systems very much in evidence.

● One of the most recent developments in transfer presses, this giant Bliss pierces 105 mm projectiles from hot billets. Heat becomes so intense during operation that two internally water cooled punches are needed at each station—and they are used alternately.

With heat like this, adequate lubrication of bearings is vital. That's why a Farval Centralized System of Lubrication was installed by the press manufacturer. Farval delivers a measured amount of clean lubricant at regular intervals to every bearing. There's nothing hit-and-miss about Farval, as an indicator at each bearing shows positive proof that its individual lubricant measuring valve has functioned.

Let Farval solve your lubrication problems, too. For complete information, write for Bulletin 26-R. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Co., Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



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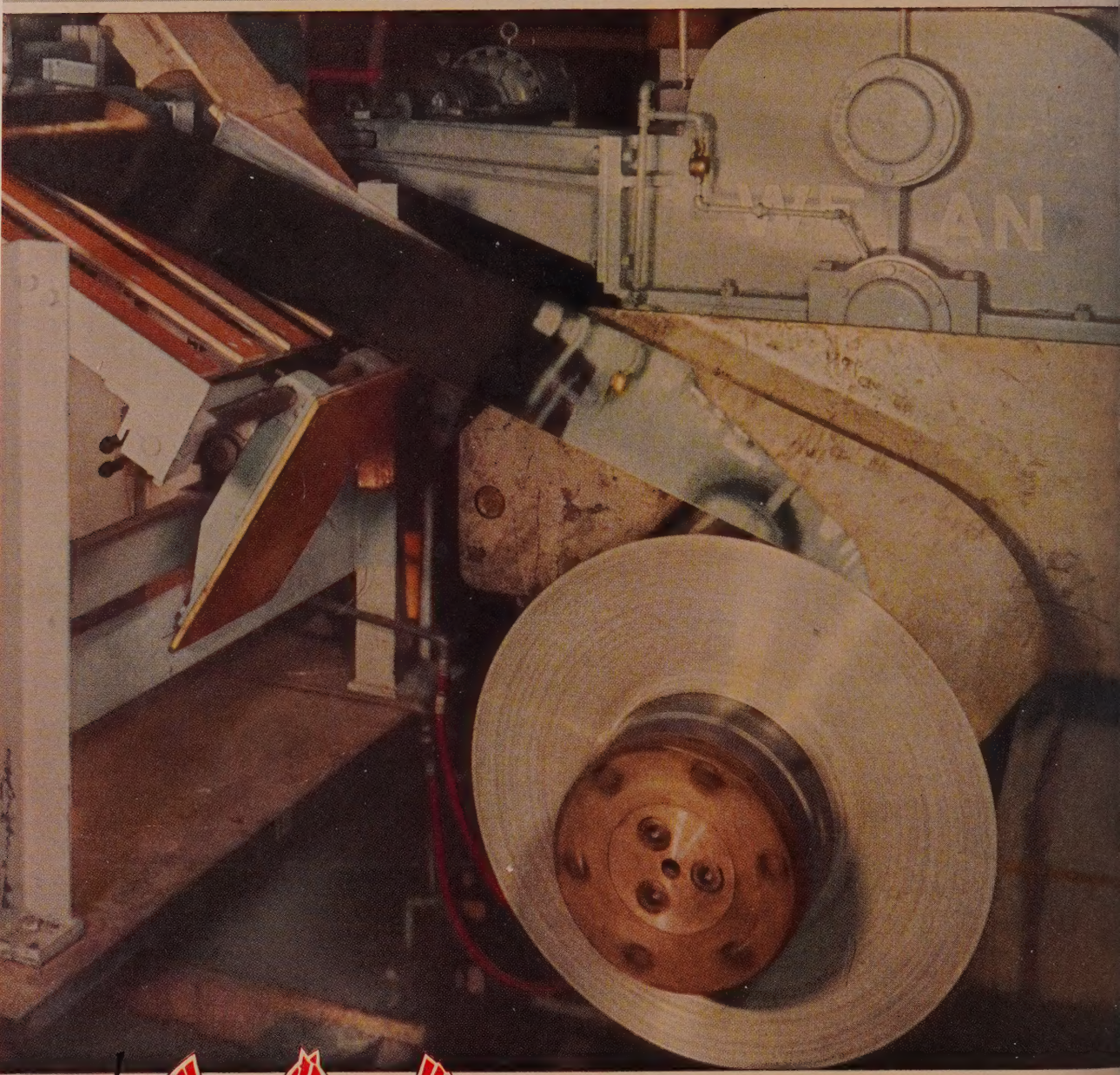

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WARREN OHIO